U. S. ARMY-NAVY JOURNAL OF

# RECOGNITION

TANK-BUSTER

JANUARY, 1944
NUMBER 5

[redacted]

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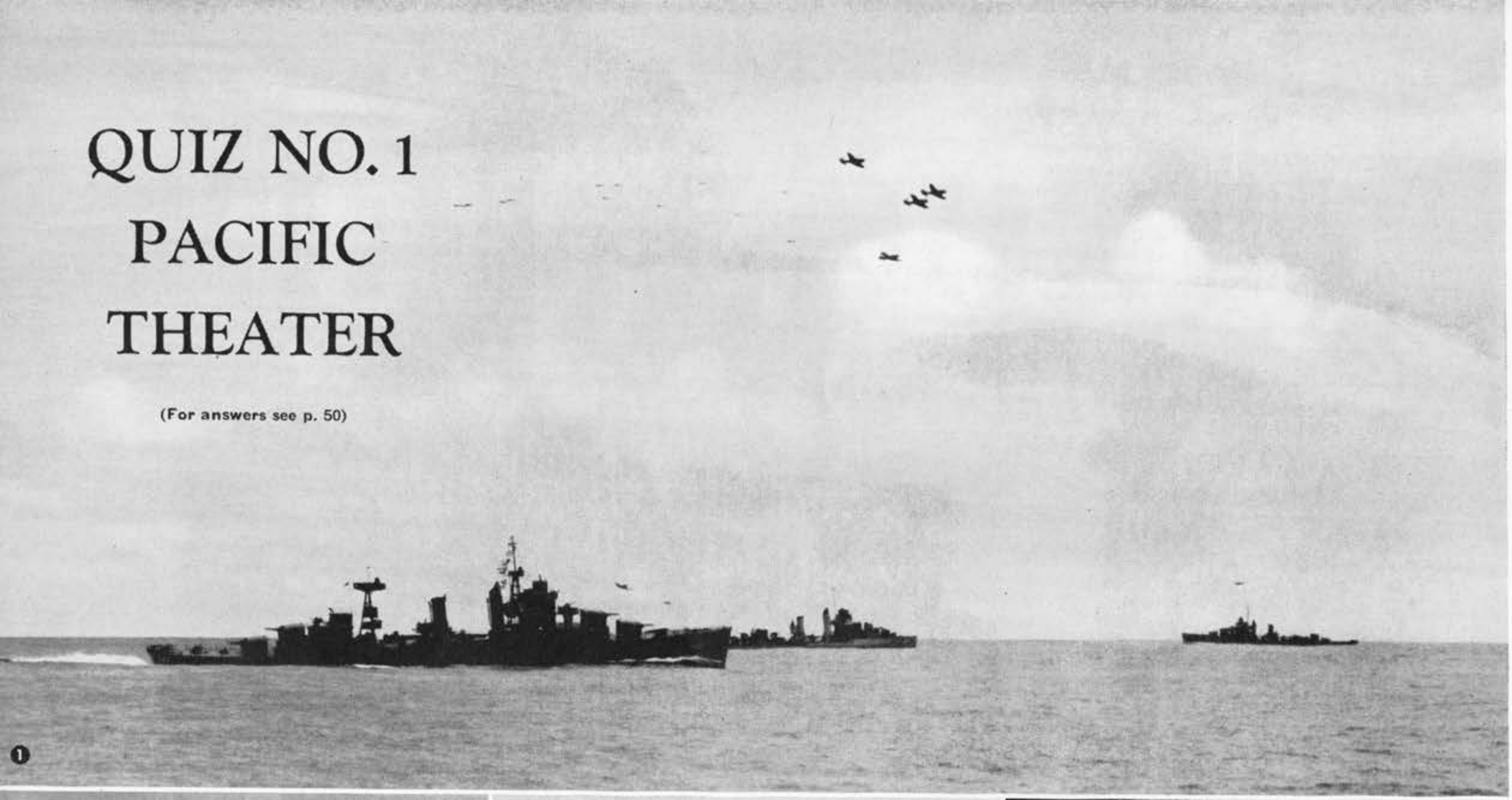
# QUIZ NO. 1
# PACIFIC
# THEATER

(For answers see p. 50)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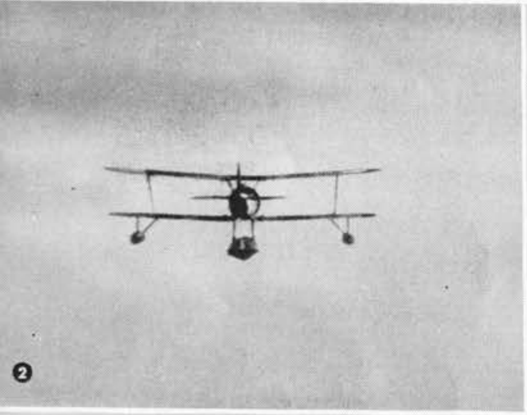
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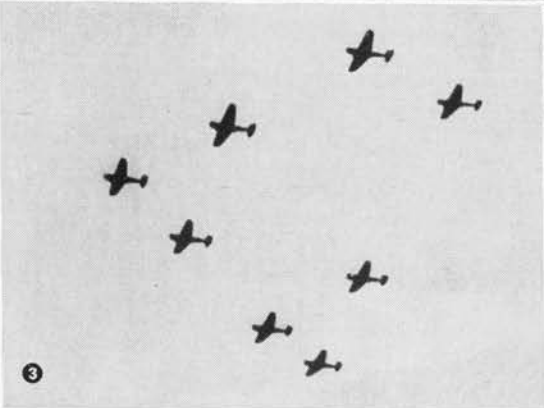
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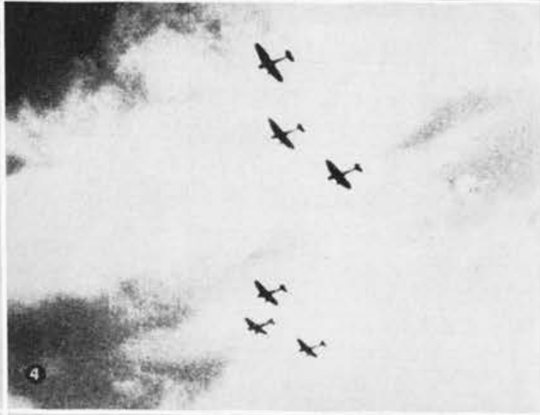
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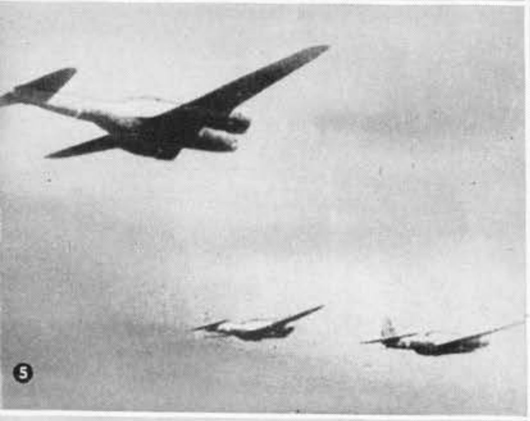
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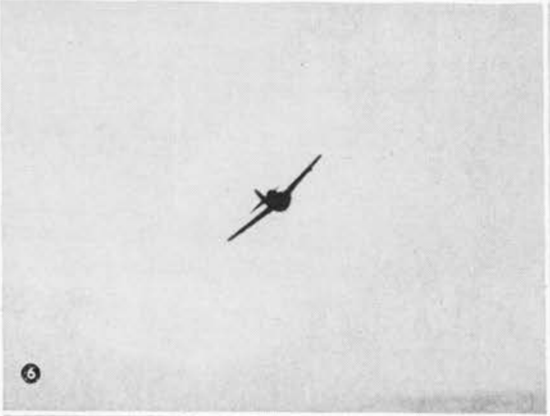
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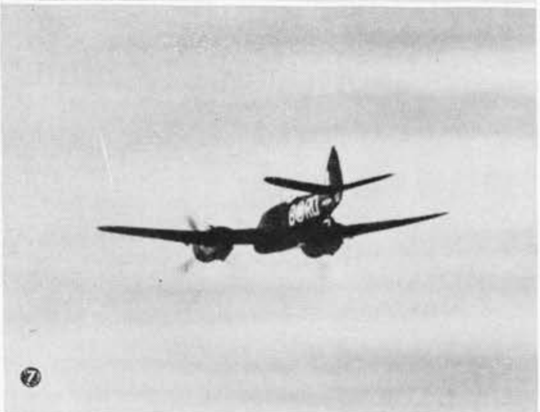
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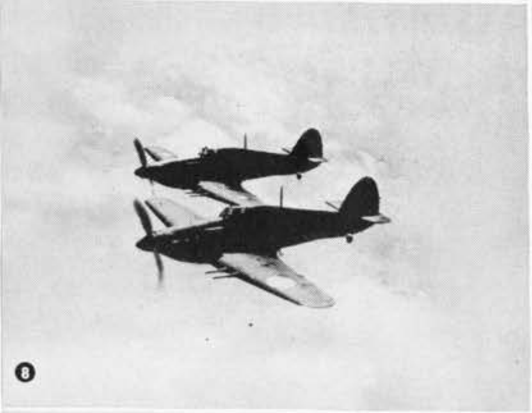
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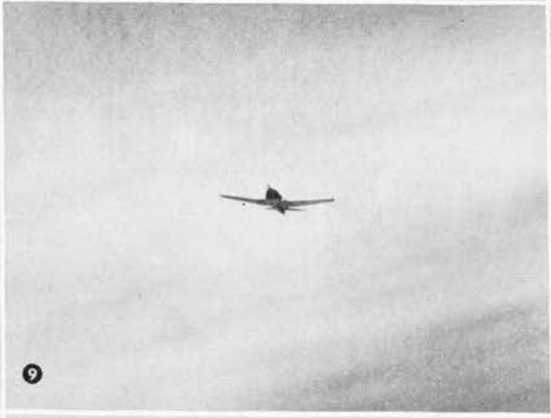
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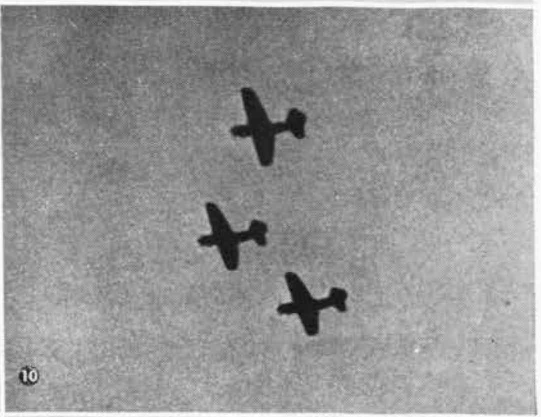
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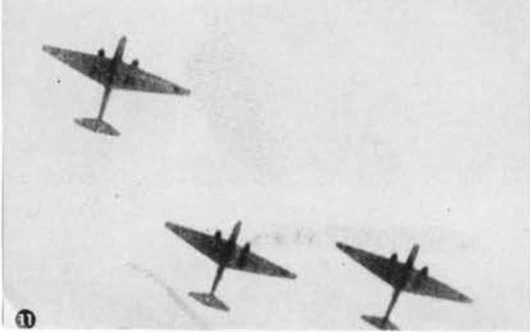
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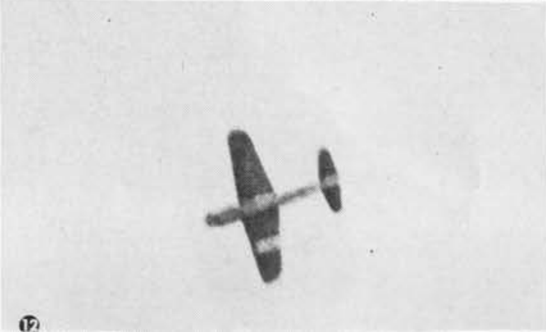
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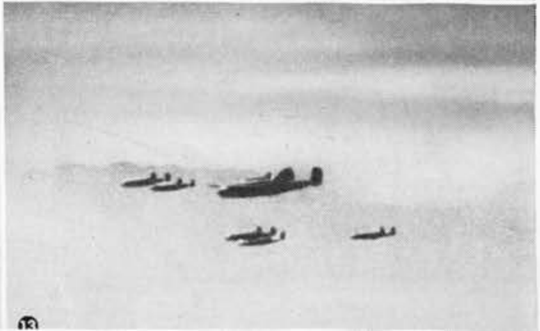
⑬

U. S. ARMY - NAVY JOURNAL OF

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JANUARY, 1944

NUMBER 5

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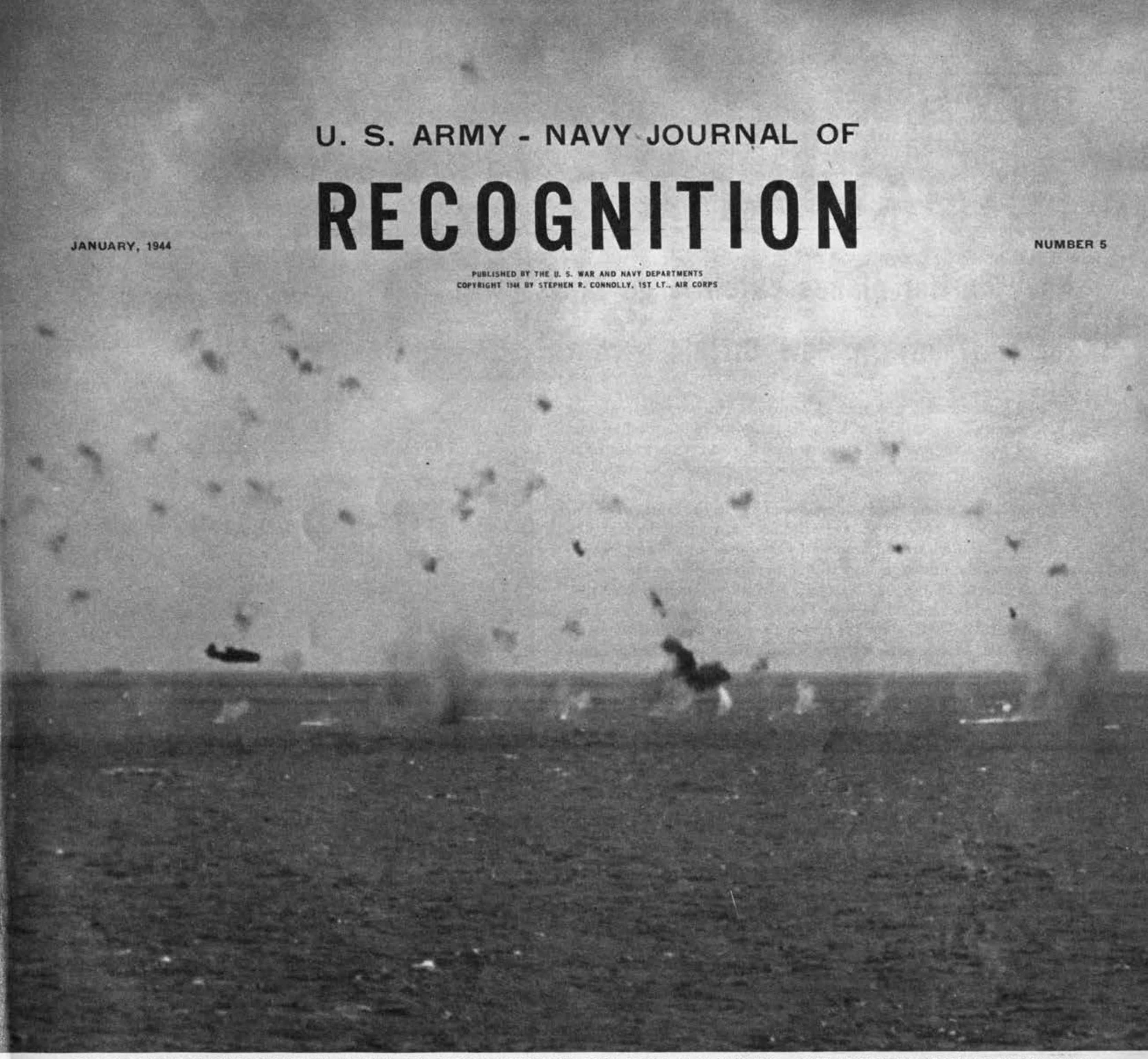


TBF SCURRIES LOW OVER WATER IN ATTEMPT TO AVOID MURDEROUS FIRE FROM U. S. CRUISER. SUCH MISRECOGNITION IS ASTONISHING

# WHOSE ENEMY?

The picture above was taken from the deck of a U. S. cruiser during a recent action in the Pacific. Attached to the back was a caption which read in part: ". . . unidentified plane that appeared to be making a torpedo attack on the U. S. S. ——— is driven off by anti-aircraft fire." No mention was made of the fate of the plane; it was not reported whether it was damaged. We sincerely hope it was not, since the airplane is an American torpedo bomber, a TBF Avenger.

Into such weapons as the Avenger go innumerable hours of painstaking training of crews, of careful research, of exquisitely precise manufacturing. In combat such weapons have to be used with skill and courage to accomplish their purpose. But if they are not able to function because a trigger-happy or under-trained gunner knocks them out of the sky, it is plainly a case of fatal waste.

Faulty recognition, in the first instance, was bad enough, and that an American pilot was fired upon even worse. Most amazing, perhaps, is the fact that even after the picture was developed and printed, no one recognized the plane.

One of our prime weapons in this all-out war is recognition; it is a weapon we cannot afford to misuse. In fighting the enemy we must use every possible angle we can to win. The men fighting alongside us, manning our ships, planes and tanks, should at least be afforded the status of allies. Whenever they are mistakenly attacked, as in the picture above, a small bell rings on the enemy's cash register. And for us it registers No Sale.

**CORRECTION** The information relative to naval operations in the Aleutians which appeared on page 3, column 2, of the December, 1943 issue of the Journal has been found to be incorrect and should be disregarded.

**NEWS**

# RABAUL RAID

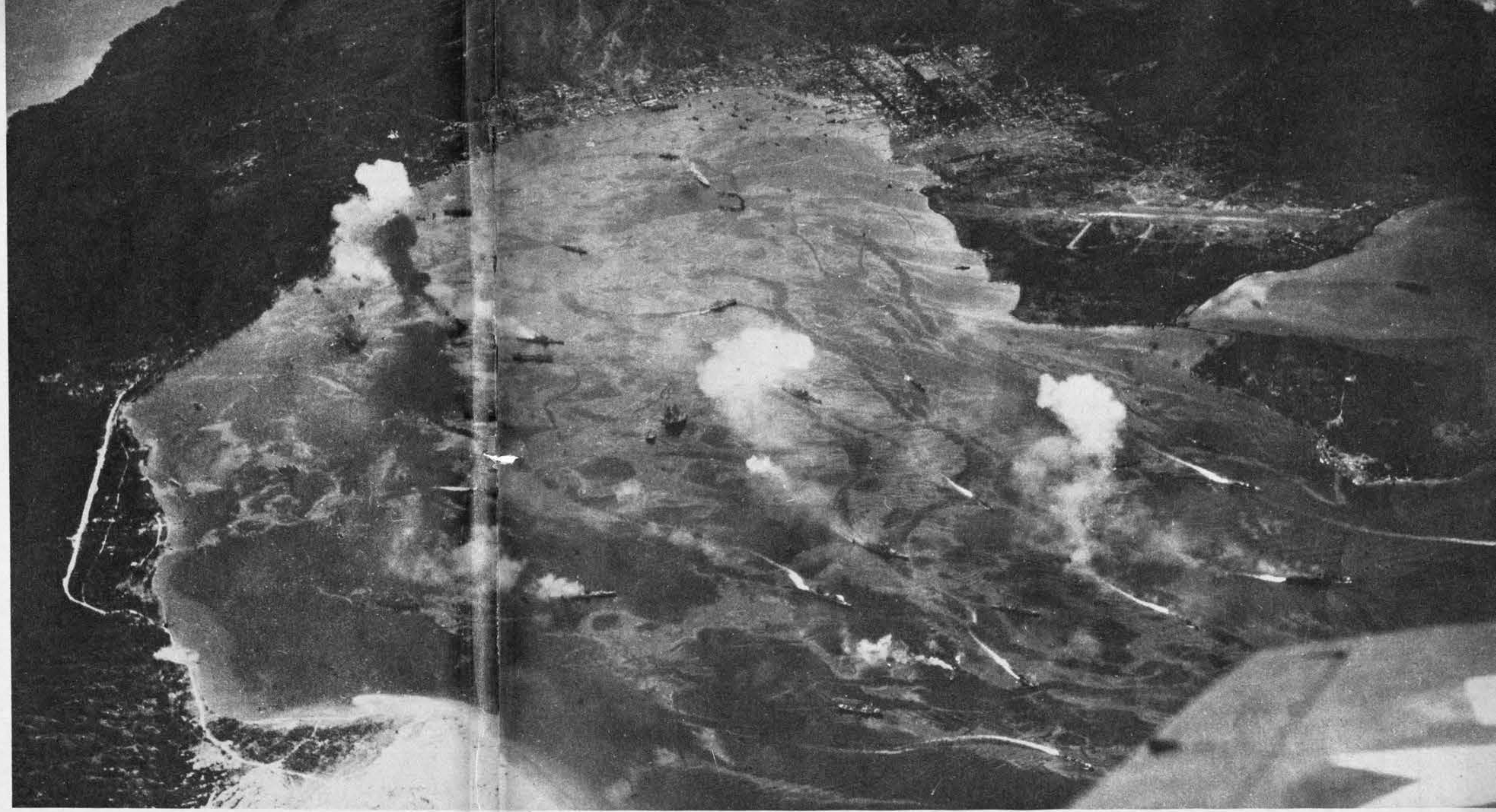
## Navy carrier planes catch large Jap force at bay in New Britain harbor

These magnificent pictures of Simpson Harbor, Rabaul, are recognition news. Taken by a U. S. Navy photographer who rode as gunner in one of the carrier-based aircraft that made the attack, they are the most comprehensive pictures available of Japanese naval force.

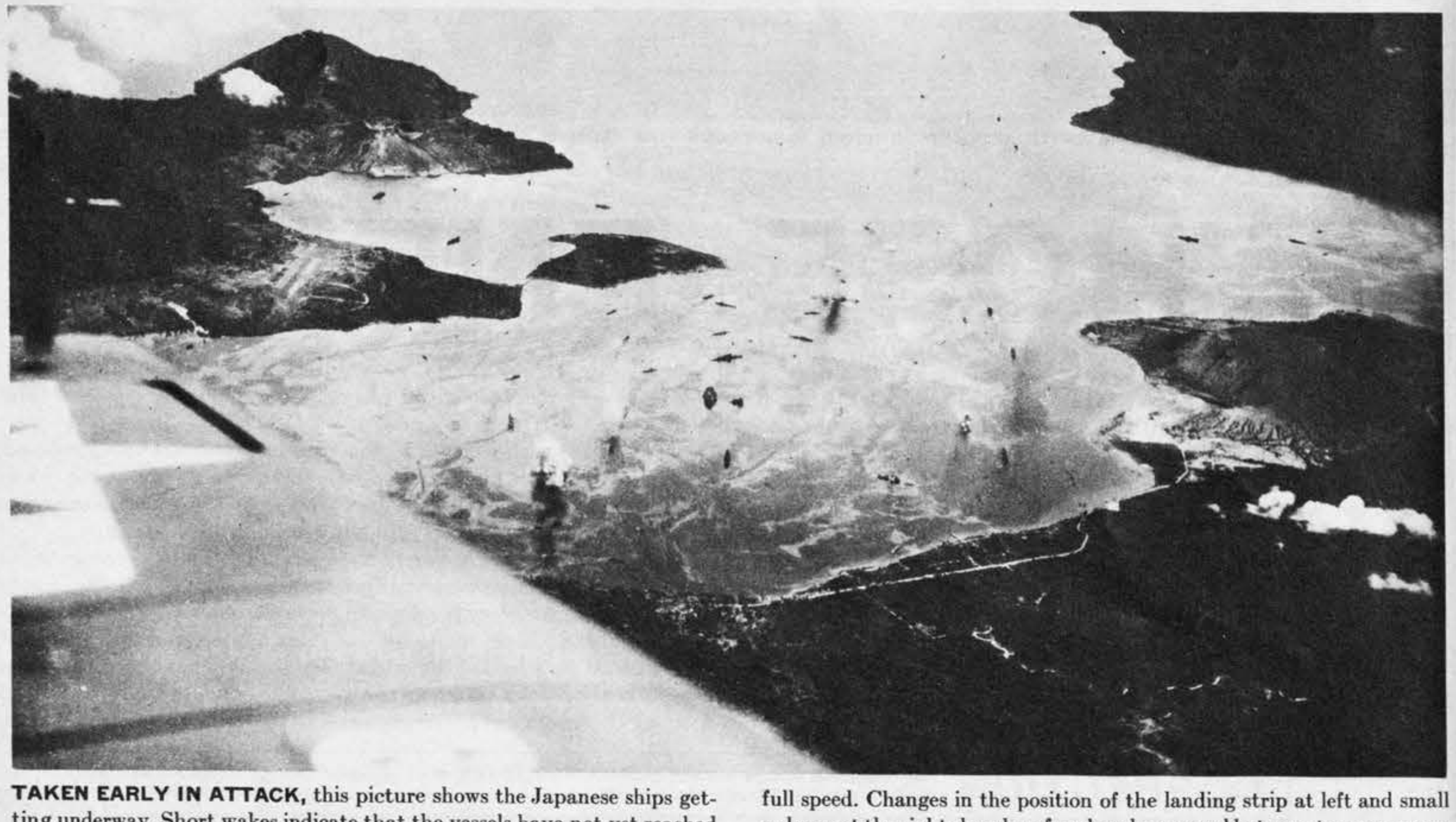
Rabaul, the second biggest Japanese base in the Southwest Pacific, has been subjected to a constant pounding in the last few months by the combined forces of the Army and Navy. These raids reached a climax in mid-November when planes from U. S. carriers caught 23 Jap warships and several merchantmen at rest in the large land-locked harbor. Before the American planes returned to their ships, they left one cruiser and two destroyers at the harbor's bottom, one cruiser and eleven destroyers badly damaged. Thirty-one enemy planes were shot down during the bombing attack and 64 more were destroyed when they attempted a revenge blow at our carriers. Considering the strength of Japanese installations in these waters, it was a feat of great daring and enterprise.

These pictures reveal the large concentration of naval strength amassed by the Japs and tell better than any news story the consternation which hit our enemy with this surprise attack. The long white wakes of the ships scurrying for the harbor mouth show the frantic efforts of their commanders to evade bombs.

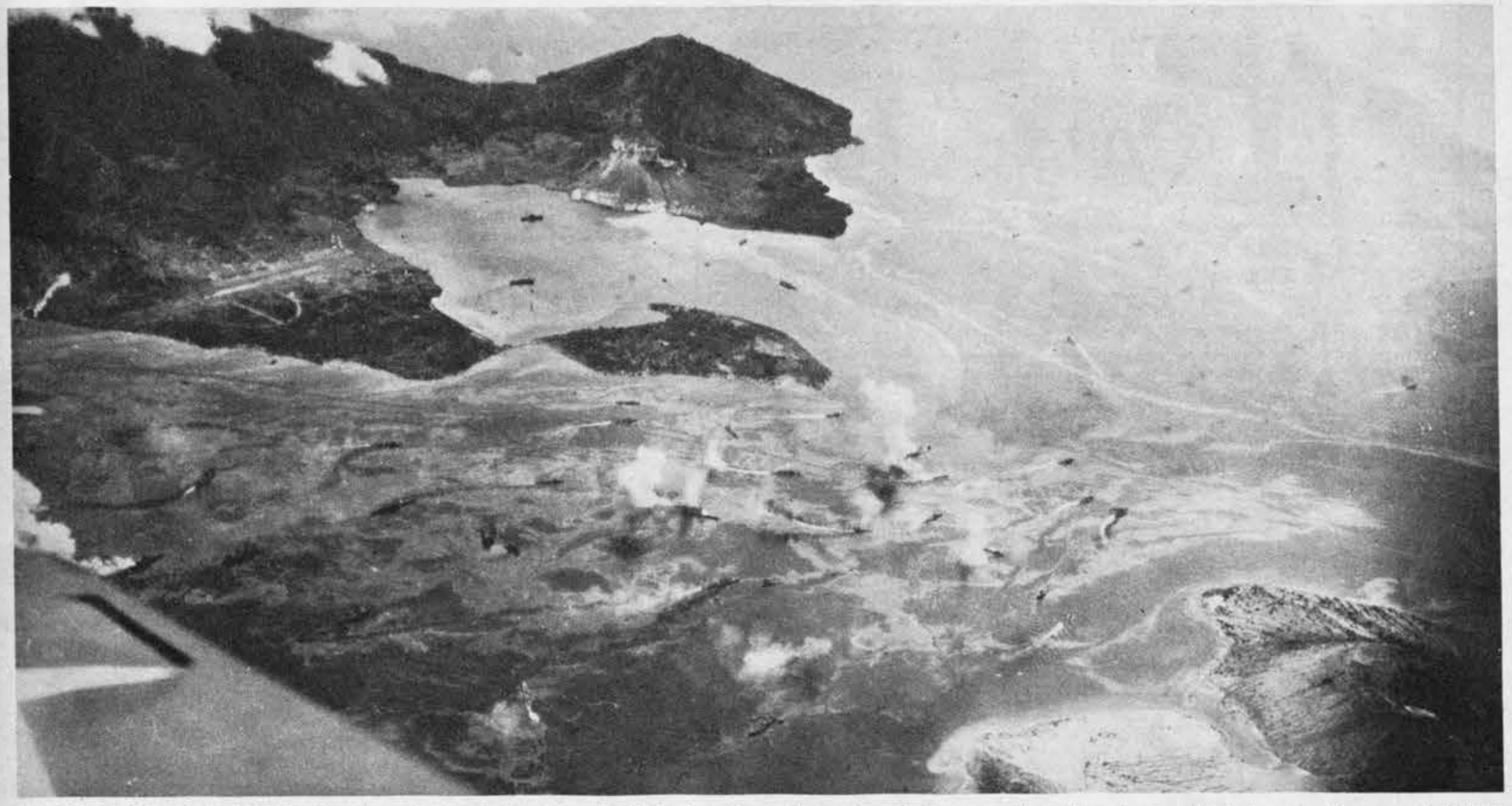
As a test of your knowledge of Japanese ships we have made a quiz of the picture at the top of this page. In it you should be able to identify heavy and light cruisers, destroyers, tankers, cargo ships and one hospital ship. The answers may be found on page 50.



PANORAMA OF SIMPSON HARBOR DURING HEAT OF RAID SHOWS LARGE CONCENTRATION OF JAP VESSELS. TWENTY-SIX OF THESE ARE IDENTIFIED ON PAGE 50. NOTE HIT SHIP, TOP CENTER, TURNING TOWARD SHORE



**TAKEN EARLY IN ATTACK,** this picture shows the Japanese ships getting underway. Short wakes indicate that the vessels have not yet reached full speed. Changes in the position of the landing strip at left and small volcano at the right show how far plane has moved between two exposures.

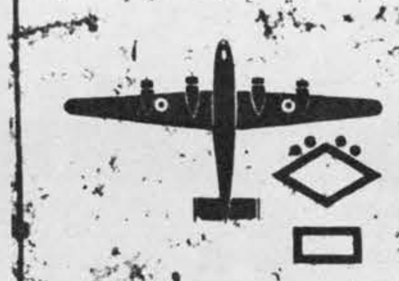


**CRISS-CROSS PATTERNS** of wakes demonstrate turmoil of Japs' mad scramble to escape. At bottom left, cruiser has swung around sharply after being bombed, seems to be burning, as fleet jams harbor mouth. From the airfield at left rose swarms of Jap planes of which 95 never returned.

# 米國主要軍用機識別圖

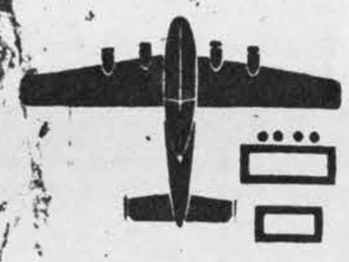
軍令部
（昭和17年10月作製）

**B-24 重爆**



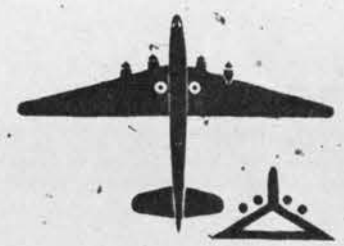
全幅 33.53米
尾翼ハ矩形ヲナシ双垂直翼ナリ 細長キ「ダイヤモンド」型翼、長キ矩形ノ胴体
等ヨリ[illegible]ス

**PB2Y 哨戒兼爆撃**



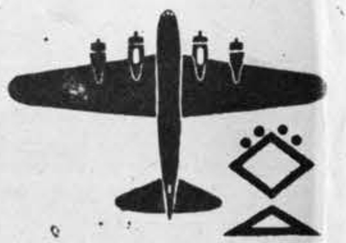
全幅 35.05米
尾翼矩形
B-24トノ相異
太キ艇体、矩形ニ近キ翼及矩形ノ翼端

**B-19 重爆**



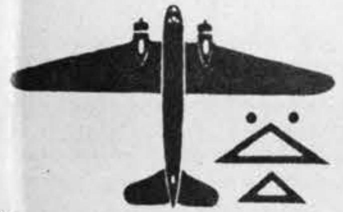
全幅 64.62米
尾翼ハ普通型
三角形ノ長キ翼、長キ機首
巨大機

**B-17 重爆**



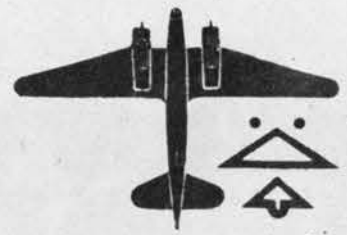
全幅 31.7米
太キ「ダイヤモンド」型主翼
三角形尾翼、丸ク厚キ胴体
短キ機首ノ先端ハ円形ヲナス

**B-18A 中爆**



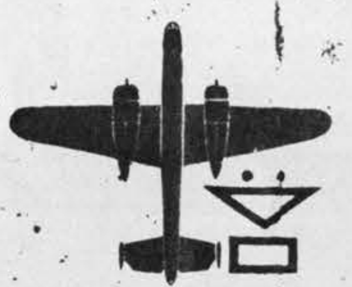
全幅 27.43米
三角型主翼
膨ラミタレ胴体
鯨ニ似タル機首

**B-23 中爆**



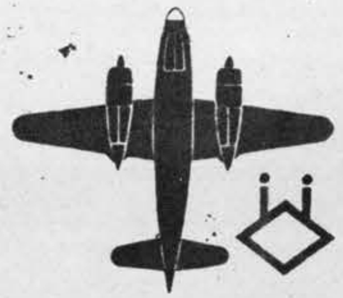
全幅 27.43米
B-18Aトノ相異
尾翼長ク其ノ先端ニ銃座アリ
胴体ハ稍細ク機首丸味ヲ帯ブ

**B-25 中爆**



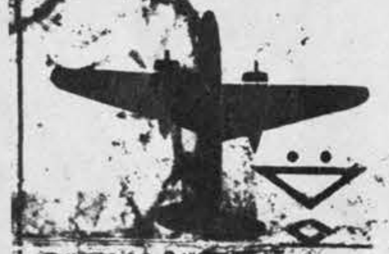
全幅 20.42米
主翼ハA-20Aニ相似ス
A-20Aトノ相異
尾翼ハ双垂直翼、矩形ヲナス

**B-26 中爆**



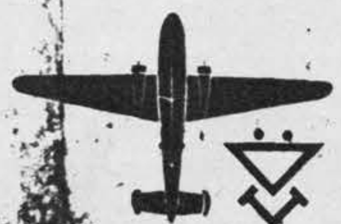
全幅 20.12米
主翼ハ「ダイヤモンド」型
發動機ハ大キク翼ノ前方ニ
可成リ突出シアリ

**A-20A 襲撃機**



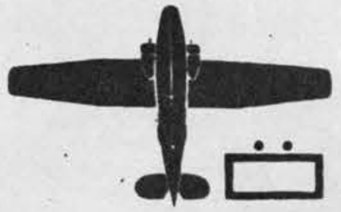
全幅 18.6米
後方ニ傾斜ヲ[illegible]ス三角形ノ主翼
「ダイヤモンド」型[illegible]翼、單垂直翼機
ハ一見猫背[illegible]恰好ヲナセリ

**PBM 哨戒兼爆撃**



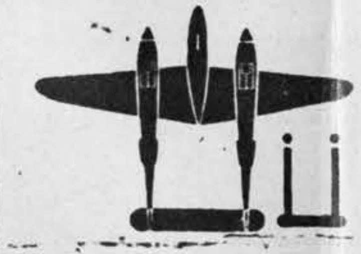
全幅 35.97米
飛行艇
上反レル尾翼、双方ノ方向舵ハ
内方ニ傾斜ス

**PBY-5 哨戒兼爆撃**



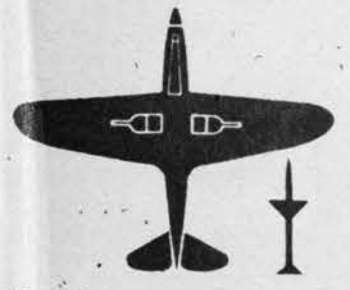
全幅 31.7米
飛行艇、双發ニシテ四角形ノ主翼
ヲ有スルハ本機ノミナリ、
機首短ク胴体太シ

**P-38 驅逐機**



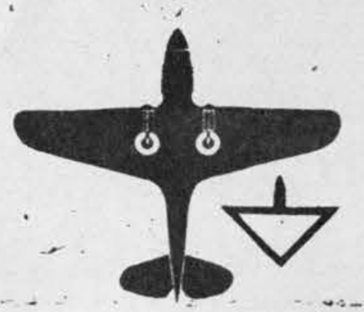
全幅 15.85米
他機種ト[illegible]著シキ特徴ヲ有
ス、細長キ尾翼双胴 双垂直翼ハ後方
ニテ尾翼ニテ連結サル

**P-39 驅逐機**



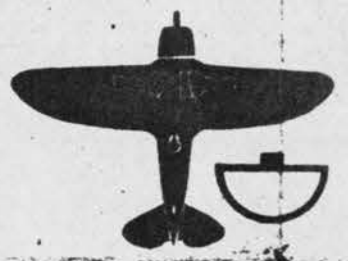
全幅 10.36米
發動機ハ[illegible]冷
細長ク先ノ尖レル機首、側面ヨリ
見タル場合 高キ操縦室 空氣取入口隆起

**P-40 驅逐機**



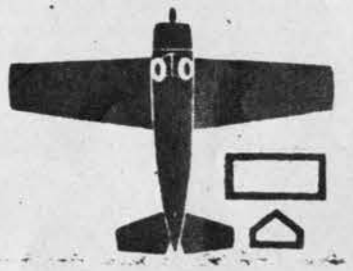
全幅 10.97米
發動機液冷
先細ノ機首ヲ有スルモP-39ノ如ク細長
カラズ、機首及「カーチス」獨特ノ三角形翼

**P-43 驅逐機**



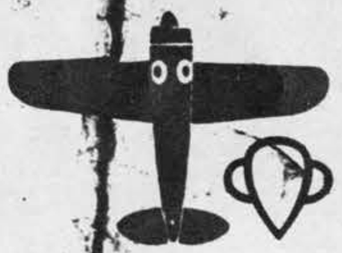
全幅 10.97米
ヅングリセル切株ノ如キ機首
翼ノ前縁ヨリ後方ヘ「カーブ」ヲ描キ
タル肉切庖丁ノ如キ主翼

**F4F 戰鬪機**



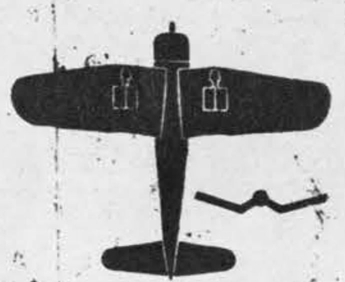
全幅 11.58米
四角形主翼
五角形ノ尾翼

**F2A 戰鬪機**



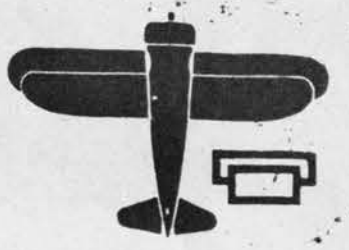
全幅 10.67米
ヅングリセル胴体
F4Fトノ相異
翼端[illegible]尾翼ノ滑カナル曲線

**F4U 戰鬪機**



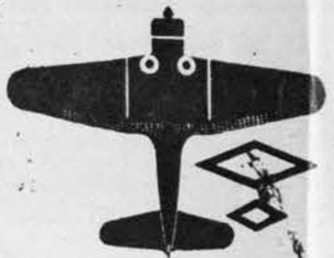
全幅 12.19米
逆カモメ型翼、之ハ殆ド凡ユル
方角ヨリ顯著ニ見ユ 狹キ尾翼

**F3F 戰鬪機**



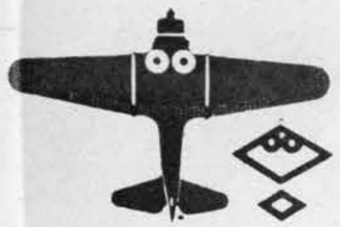
全幅 9.75米
海軍ニテ[illegible]使用中ノ複葉機 1
短ク太ク脹レタル胴体

**SBD 索敵兼爆撃**



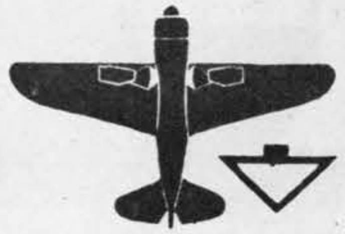
全幅 12.8米
急降下爆撃機
「ダイヤモンド」型主翼並ニ尾翼 急降下ノ
際ノ速度[illegible]開閉容易ニ視認[illegible]

**A-17A 襲撃機**



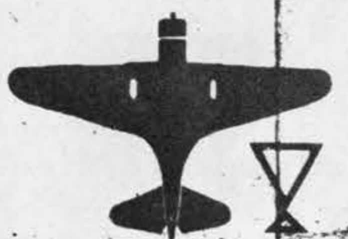
全幅 14.02米
SBD及A-24ハ同ジ様ニ見ユ
[illegible]翼及尾翼ハ「ダイヤモンド」型、[illegible]ミタ
ル場合 車輪ト胴ト相接觸ス、小サキ機首

**SB2C 索敵兼爆撃**



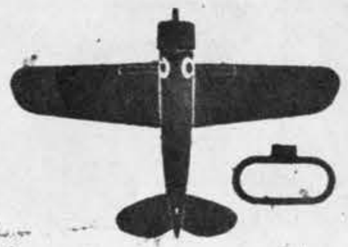
全幅 15.24米
「カーチス」ノ典型的三角形翼
角形ノ機首

**TBD 雷爆撃機**



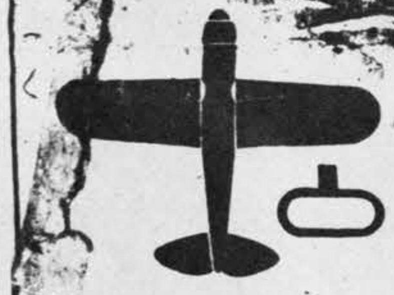
全幅 15.24米
非常ニ深ミノアル三角形翼 尾翼ノ
方向ニ向ヒ先細トナル、尾翼ハ之ト
反對ノ三角形ヲナス

**SBN 索敵兼爆撃**



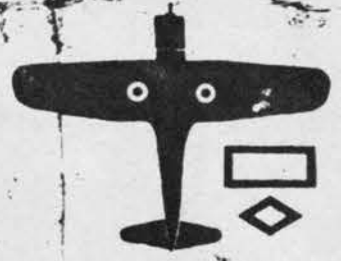
全幅 11.89米、
SB2A及F2Aト同一ノ丸キ「ブリュスター」
翼ヲ有ス、短キ機首、細キ胴体

**SB2A 索敵兼爆撃**



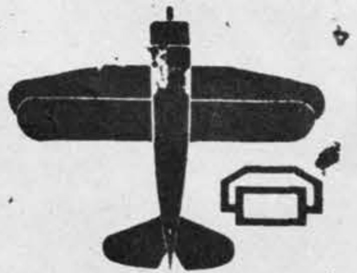
全幅 14.33米
圓味ノアル翼、長キ機首

**SB2U 索敵兼爆撃**



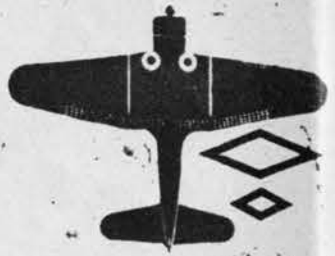
全幅 12.8米
F4Uト同様ニ見ユ、F4Uトノ相異
四角形ノ翼、翼端 但シ尾翼ハF4U
ト同ジク「ダイヤモンド」型

**SBC 索敵兼爆撃**



全幅 10.36米
複葉機
急激ニ後退セル上翼 胴体長シ

**A-24 襲撃機**



全幅 12.8米
SBDト同型ナリ 陸軍ニテ使用ス
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# JAPS STUDY U.S. PLANES

# MERCHANT SHIPS

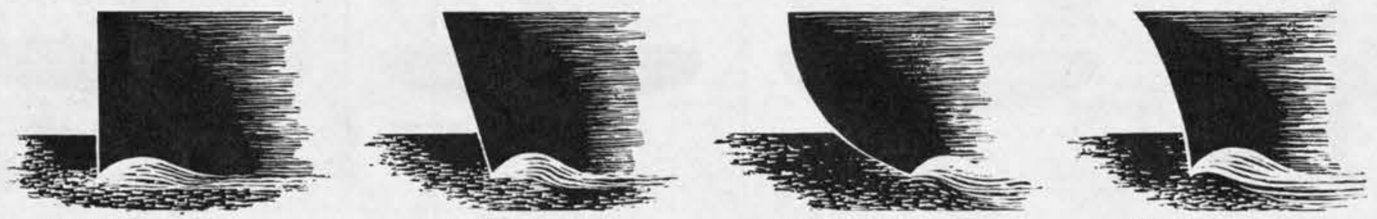
## The battle of transportation rages incessantly on a world-wide front

INVASION CONVOY STEALS INTO CASABLANCA IN DARK HOURS OF MORNING. THE PASSENGER LINER IN FOREGROUND HAS BEEN CONVERTED TO TROOP TRANSPORT. SHIPS IN DISTANCE ARE WAR-FITTED CARGO VESSELS

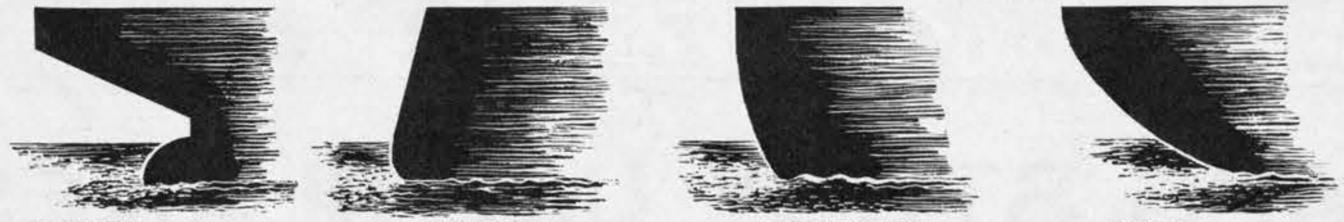
First to serve in time of war is the Merchant Marine. Without it battles cannot take place. Planes, guns and men cannot fight; food, oil and ammunition cannot reach the field. Even before the U.S. entry into the war, lend-lease shipments ran the U-boat gantlet to Britain and Russia, helped hold the civilized world together. Sailing the long sea lanes of the world, alone or with little protection, ships went down faster than they came off the ways. But the endless procession of ships kept fanning across the oceans to the battlefronts and, gradually, as more of them left the shipyards and convoy protection increased, there were merchant ships enough to launch a second front in Africa and an offensive in the Pacific.

The chart below shows how to spot merchant ships according to differences in hull and superstructure. A further description of their characteristics and duties appears on following pages. Learning to know ship types is easy and very important. The kind of ships in an enemy convoy indicates projected strategy. Tankers may mean only a refueling operation; freighters, a garrison reinforcement. Attack-cargoes and transports may be the prelude to grand-scale invasion. A complete presentation of merchant ships is given in Navy Department manual ONI 223-M, Merchant Ship Shapes.

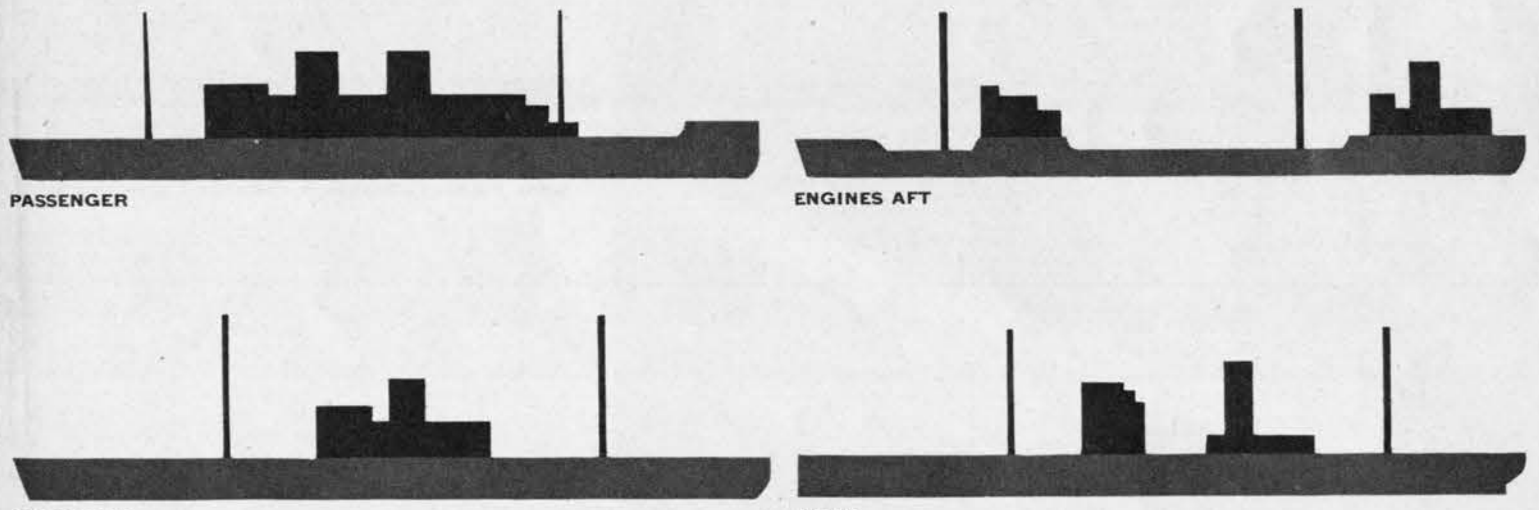
### BOW TYPES



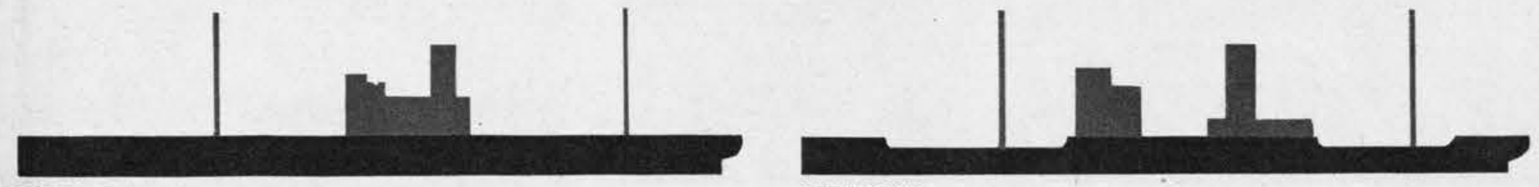
### STERN TYPES



### SUPERSTRUCTURE TYPES



### HULL TYPES



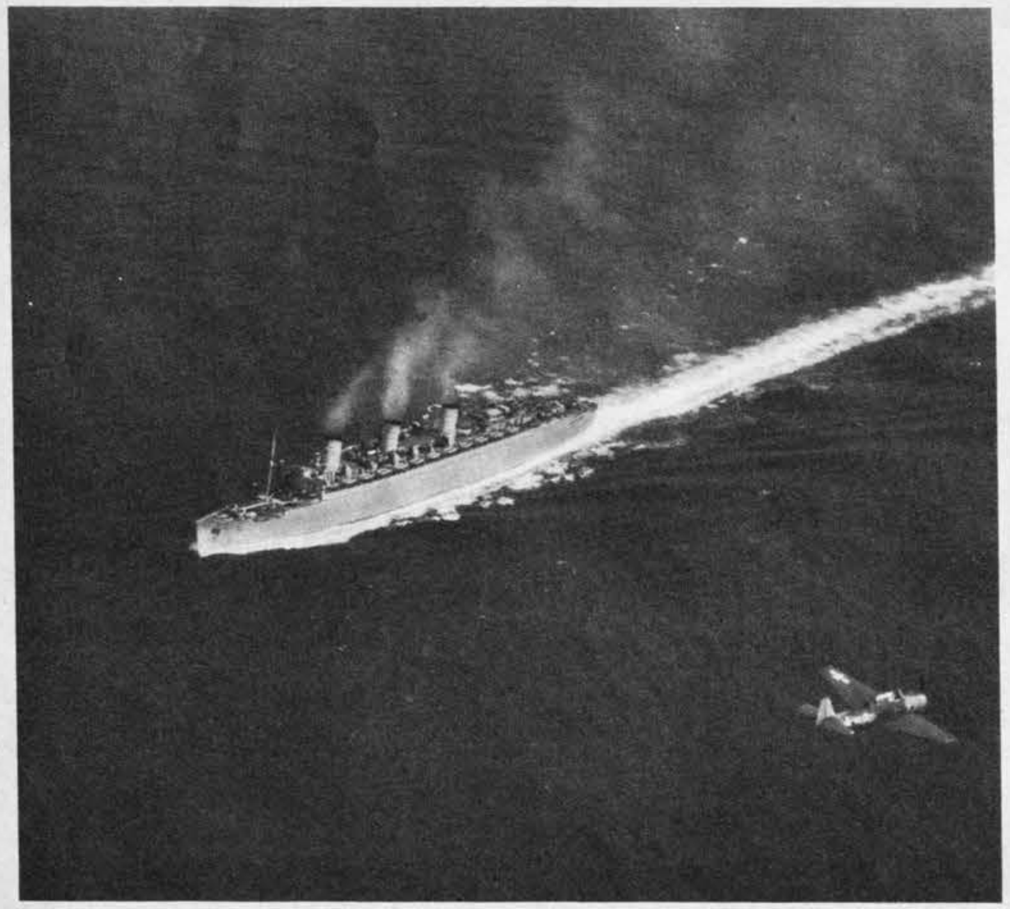
# PASSENGER SHIPS

## Peacetime luxury liners, stripped for action, transport thousands of men to fighting fronts

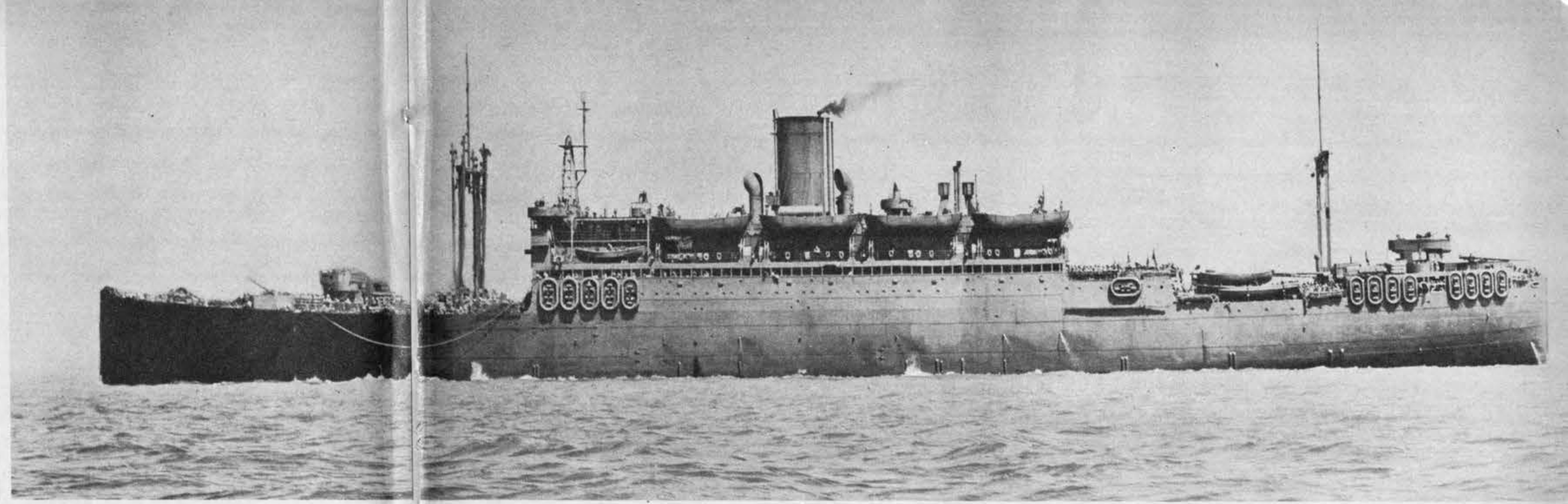
The years before the war saw the principal countries of the world rivaling each other to build the biggest, fastest, most luxurious passenger liners. Liners like the Normandie, Queen Mary, America, Rex, Ile de France, Bremen and Europa, too expensive to be operated by private enterprise, were subsidized by their governments for the sake of national prestige. Liabilities in peacetime, they have become tremendous assets as high-speed transports and hospital ships. Lavish ballrooms and cocktail lounges, exquisitely appointed suites and dining salons have been shorn of finery and transformed into dispensaries, mess halls and living quarters. The Queen Mary (*below*), third largest of the luxury liners, can do 34 knots, 10 more than the fastest submarine. More than once in the early days of the war she relied on her speed to dash unescorted through U-boat hunting grounds. On decks, in cabins and holds, she can pack as many as 20,000 troops, once carried a fully-equipped division from Britain to Suez. The America, now called the West Point, largest U. S.-built passenger liner, has the latest safety equipment, cruises at 22 knots and carries 12,000 troops besides her regular crew.

Passenger ships are the easiest of all merchant vessels to recognize. Prominent in size, they have unusually high center superstructure made up of several decks extending for at least a third of the hull length. Long rows of lifeboats or small landing boats and rafts, large funnels, numerous ventilators make it impossible to confuse them with ships of any other type. Besides fore and mainmasts, some have "jury masts" on superstructure, prominent kingposts on hull or superstructure.

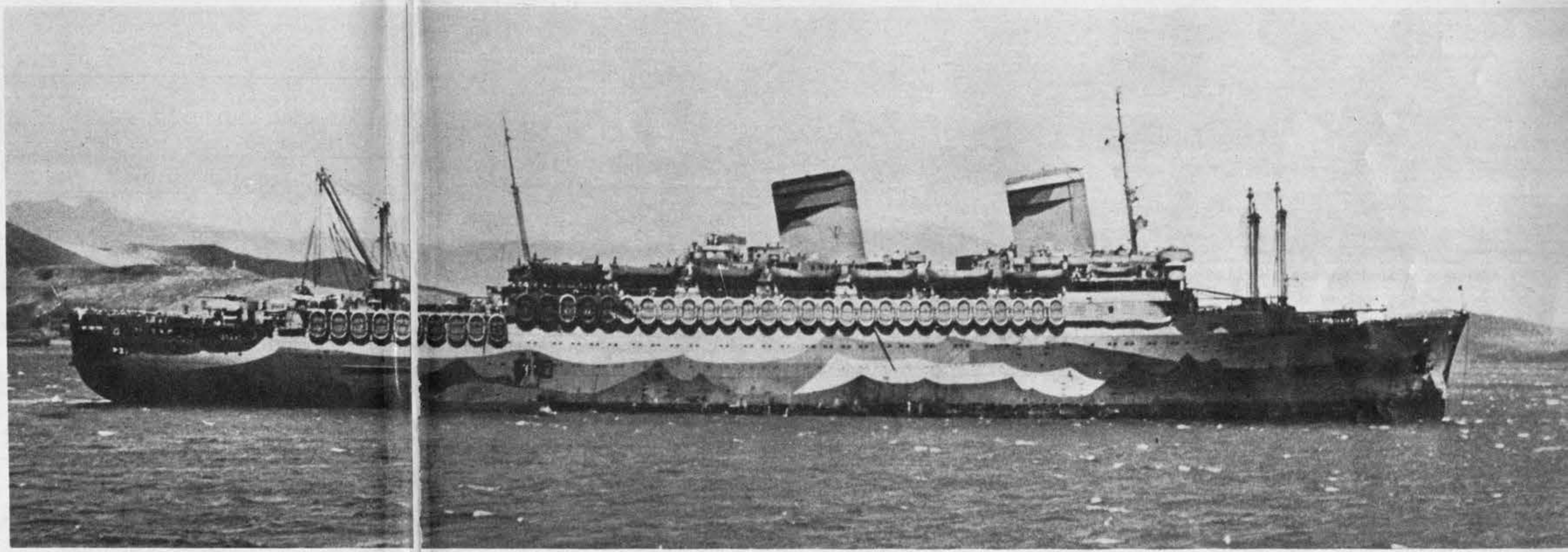
The Queen Mary (*below*) and the West Point (*right center*) exemplify the most modern passenger-ship designs. Their raked bows cut cleanly through the water. Their funnels are short and fat. All the lines of the hull and superstructure have a swept-back streamlined look. The Wakefield, ex-Manhattan, (*lower right*) has an older design counter stern which differs from the cruiser sterns of the first two vessels. Otherwise she looks very much like the West Point above her. The plumb bow and stern, tall, thin, coal-burning stack and severely squared contours of the World War I vintage President Line vessel at top right make her the ugly duckling of the passenger fleet.



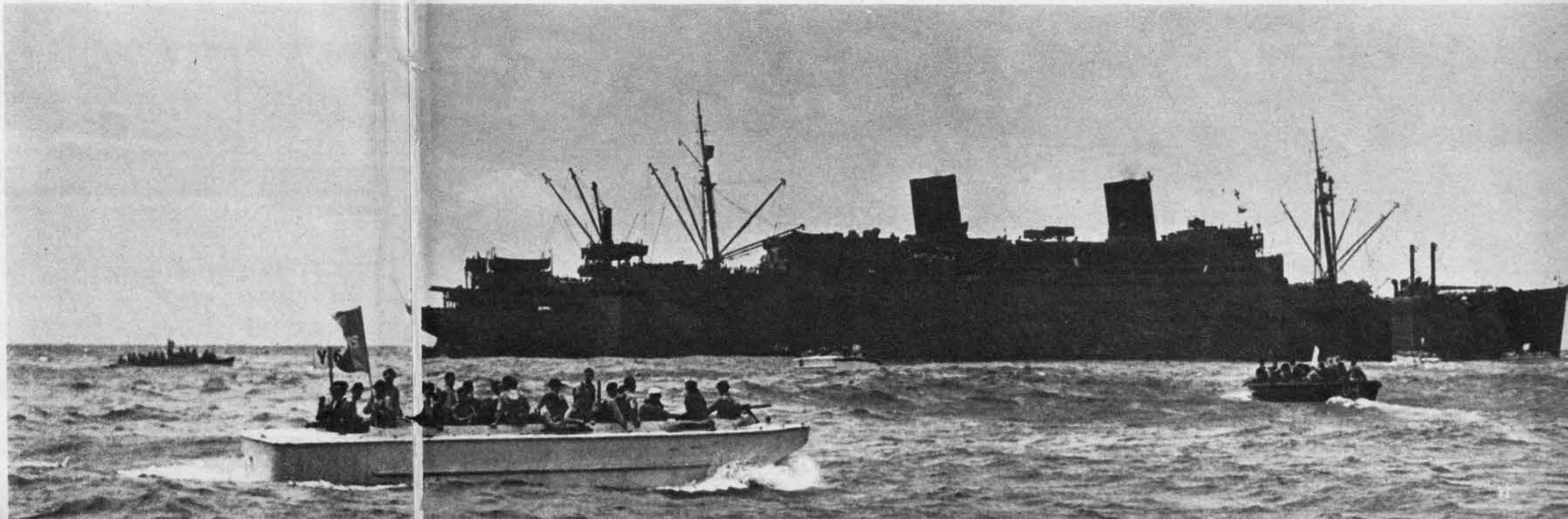
**QUEEN MARY** is the world's fastest passenger ship. Her massive raking funnels go with enormously powerful engines. Solid, twelve-deck superstructure spreads over ¾ of hull.

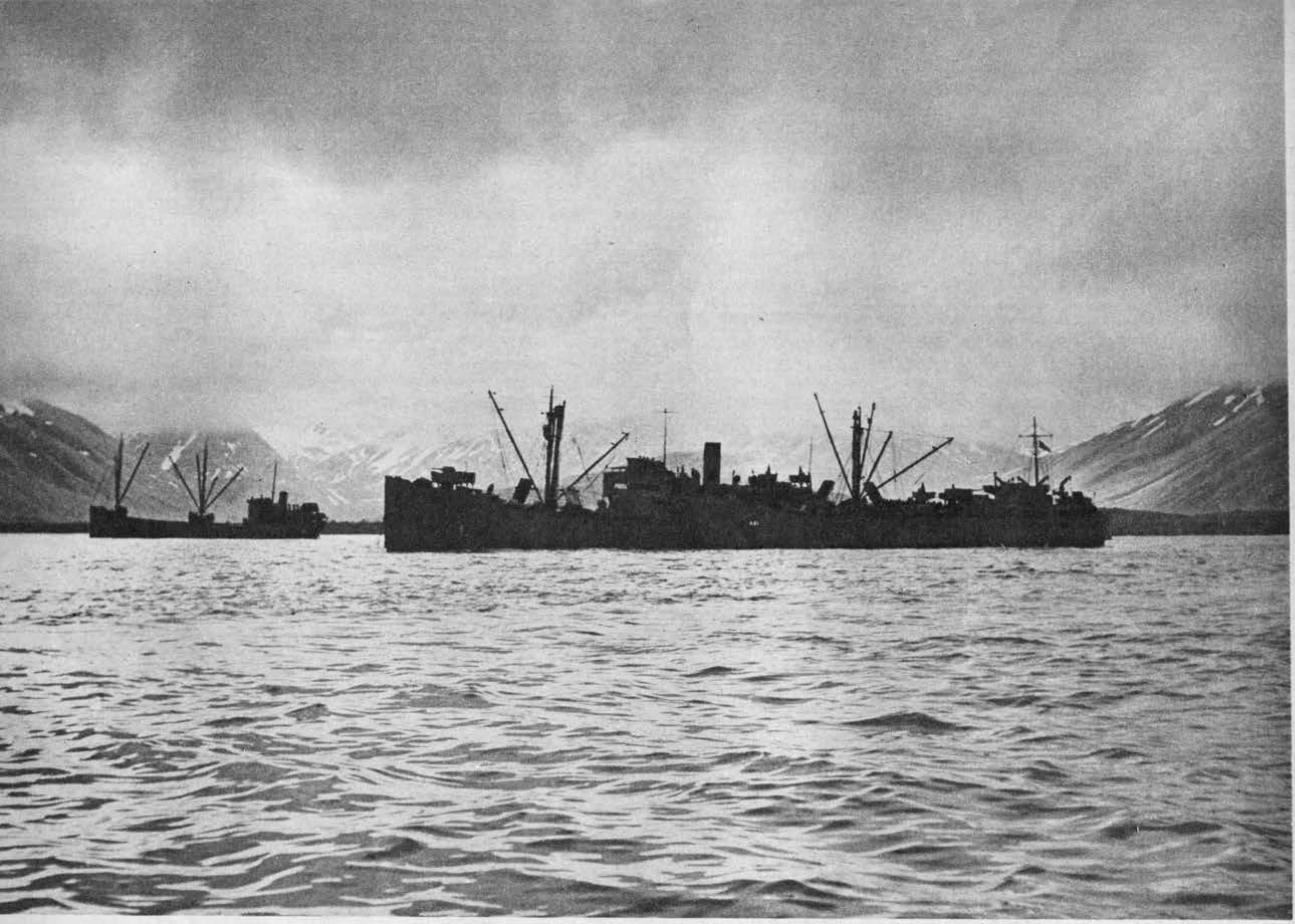


HOG ISLANDER, "A SHALLOW FLOWER BOX WITH A POT IN MIDDLE," WAS BUILT IN FIRST WAR WITH OLD-STYLE PLUMB BOW AND ODD STERN, HAS CARGO-HANDLING KINGPOSTS ON FOREDECK



WEST POINT, EX-AMERICA, LARGEST U.S. SHIP, HAS STREAMLINED SUPERSTRUCTURE OF MODERN DESIGN. BELOW: THE WAKEFIELD, EX-MANHATTAN, HAS OLD-STYLE COUNTER STERN, PLUMB BOW



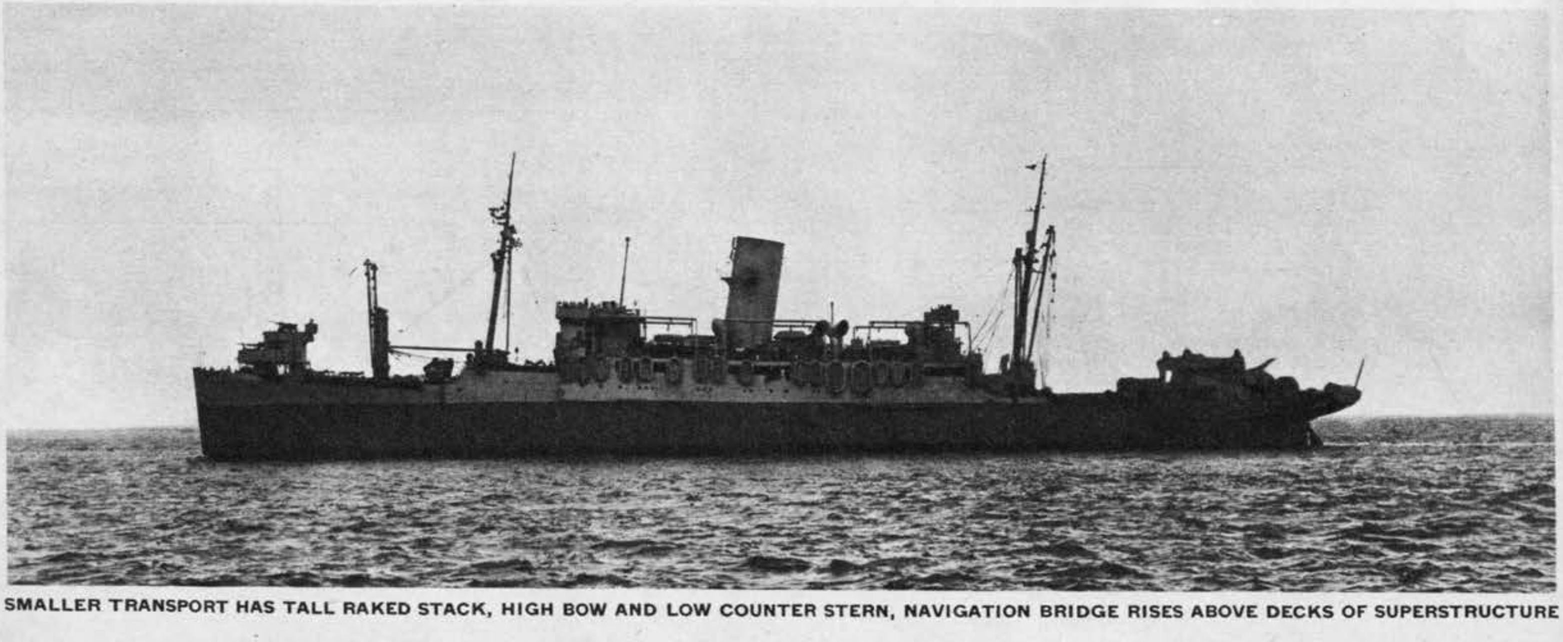


ANCHORED AT ADAK HARBOR IS AN OLD COASTAL CARGO SHIP (LEFT) WITH ENGINES AFT, AN OLD WELL-DECK PASSENGER-CARGO LINER AND AN LST

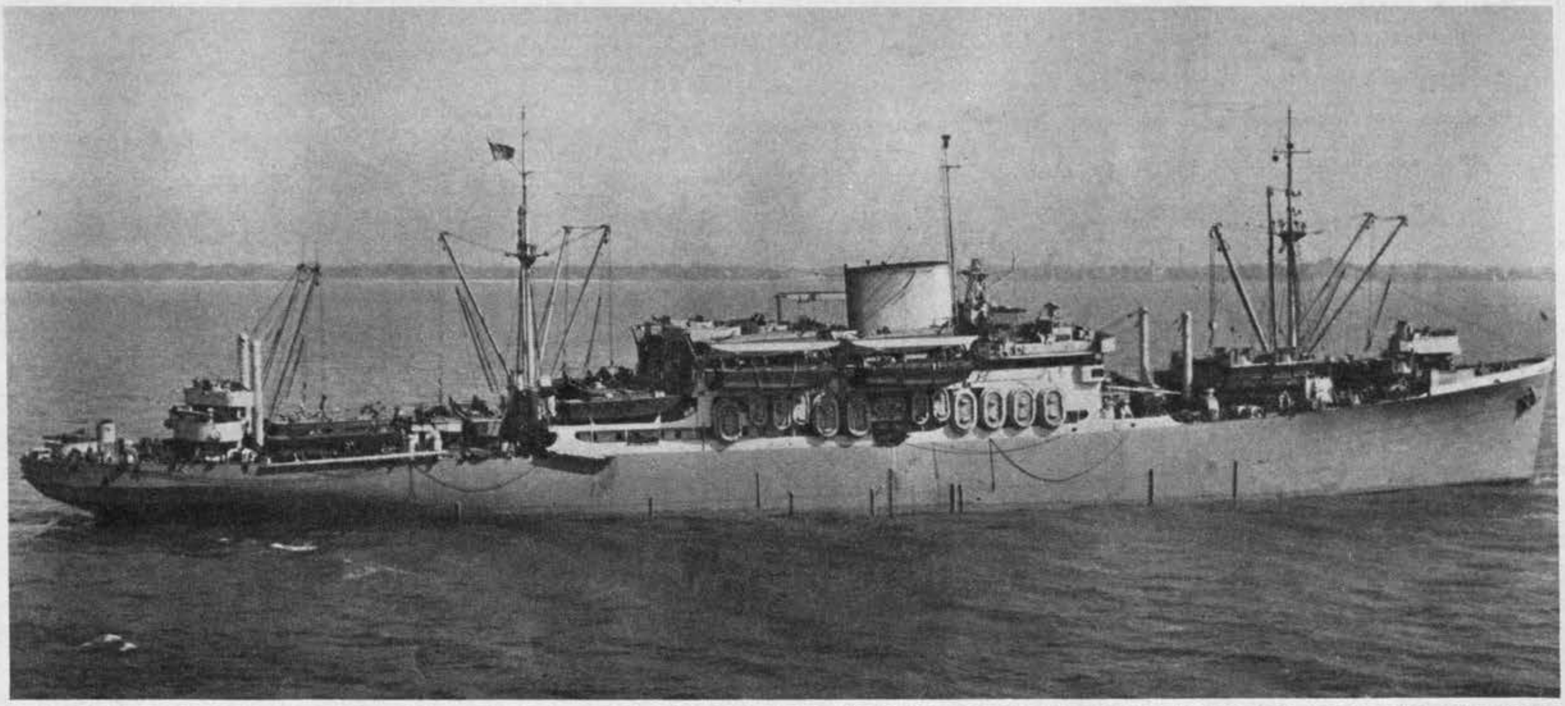
# PASSENGER-CARGO SHIPS

## Cruise ships and fruit liners carry assault forces to invasion shores

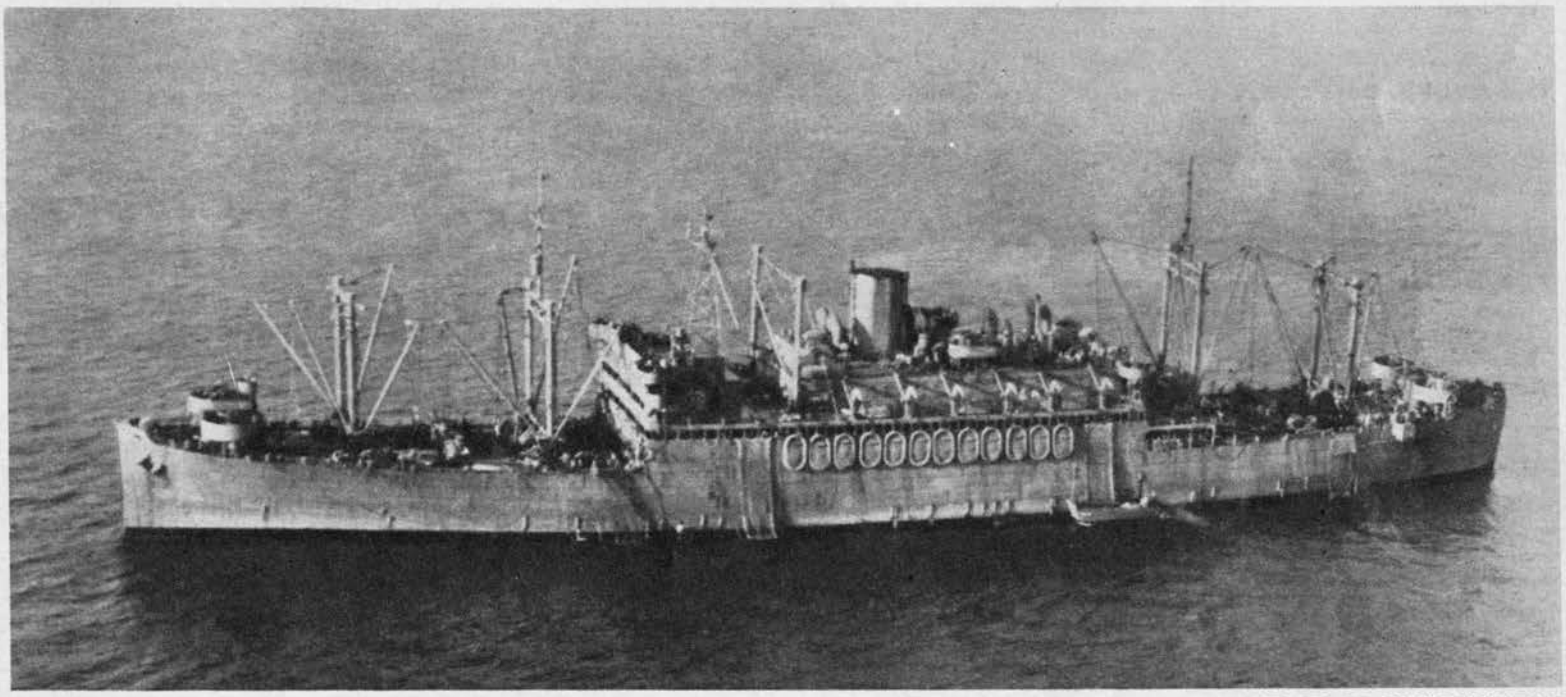
Armed and commissioned for fleet service are many passenger-cargo ships that once plied the warm waters off South America with loads of beef or bananas. Half freighter, half passenger vessel, these ships have several decks to accommodate passengers, kingposts and booms for loading cargo hatches. They are slower and smaller than passenger liners, have a deck superstructure extending more or less one-third the length of the hull, and one funnel. As transports (AP), attack transports (APA) and headquarters ships (AGC) they perform many dangerous missions. Attack transports carry men and equipment into battle areas, then also serve as bombardment ships to cover landings. Headquarters ship serves as the brains of the landing operation, maintaining communications between the various arms of the attack group.



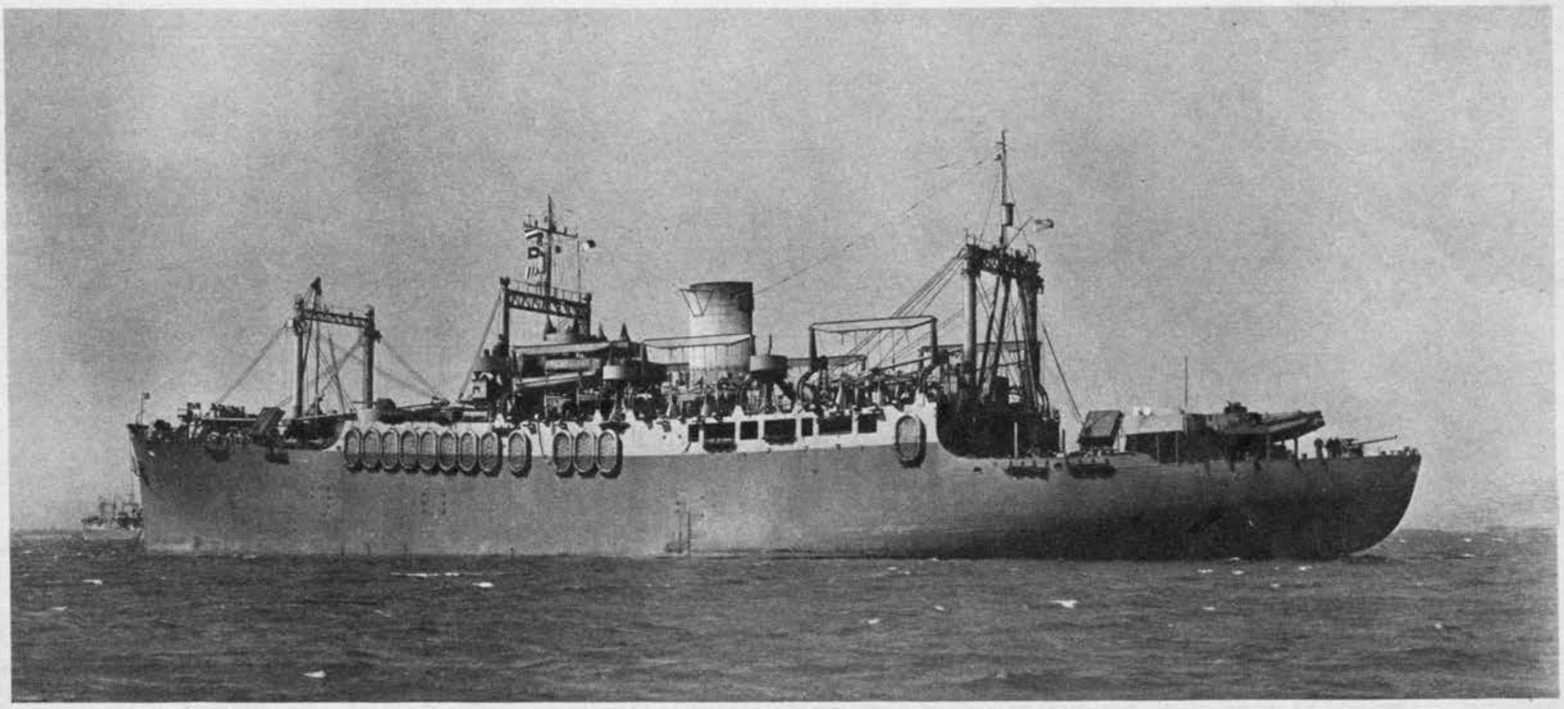
SMALLER TRANSPORT HAS TALL RAKED STACK, HIGH BOW AND LOW COUNTER STERN, NAVIGATION BRIDGE RISES ABOVE DECKS OF SUPERSTRUCTURE



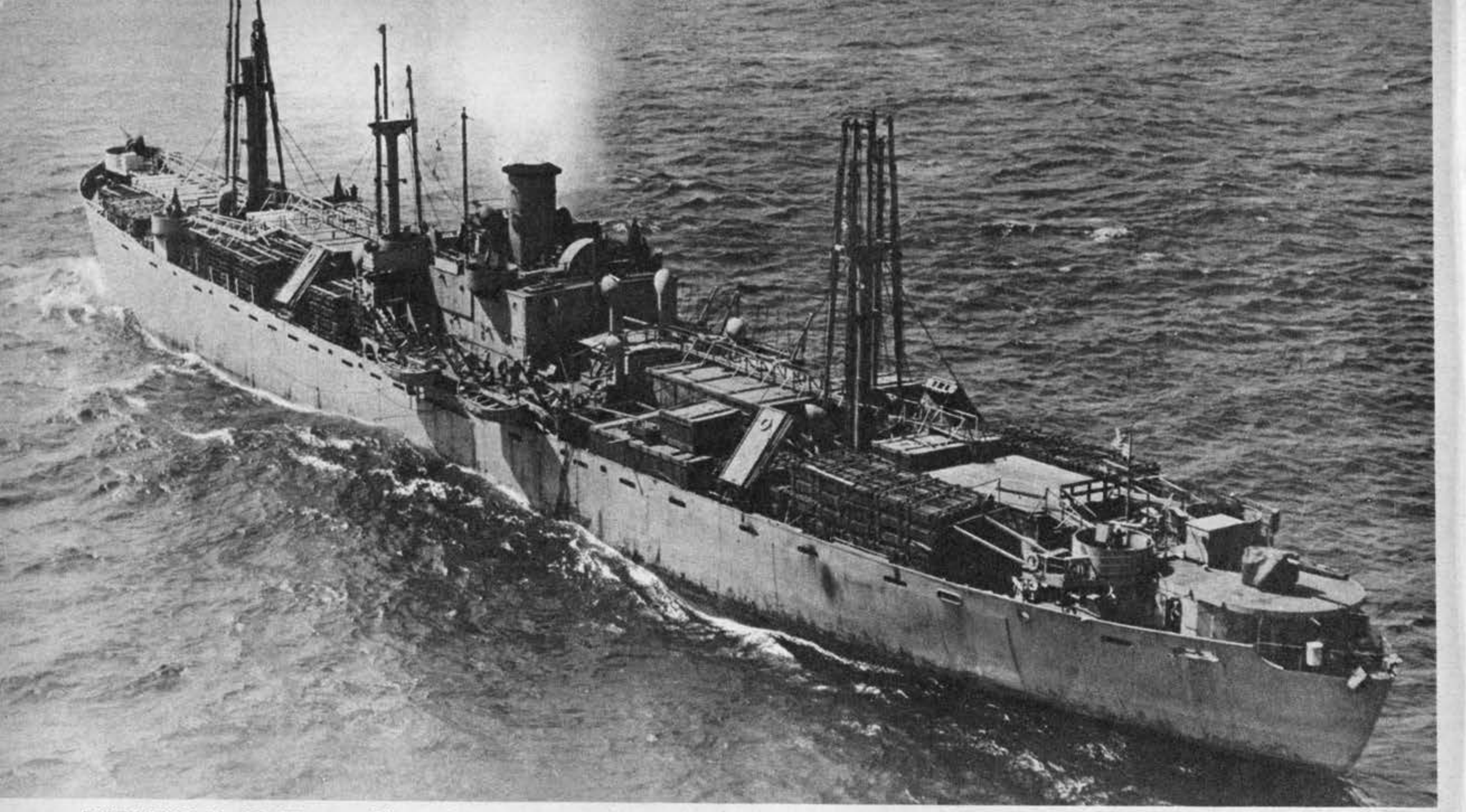
U.S.S. CHARLES CARROLL CARRIES A DOZEN SMALL LANDING CRAFT ON DECK. SHE WAS BUILT AS THE DELURUGUAY IN 1940, CARRIED 63 PASSENGERS



OLD PLUMB BOW, PLUMB STERN SHIP HAS SQUARE SUPERSTRUCTURE, TWIN GUN SPONSONS FORE AND AFT. NOTE KINGPOSTS ON SUPERSTRUCTURE



U.S.S. JAMES O'HARA IS AN ATTACK TRANSPORT OF RECENT DESIGN. TOPMASTS ARE STEPPED-ON TRUSS MEMBERS OF HEAVY GOAL-TYPE KINGPOSTS



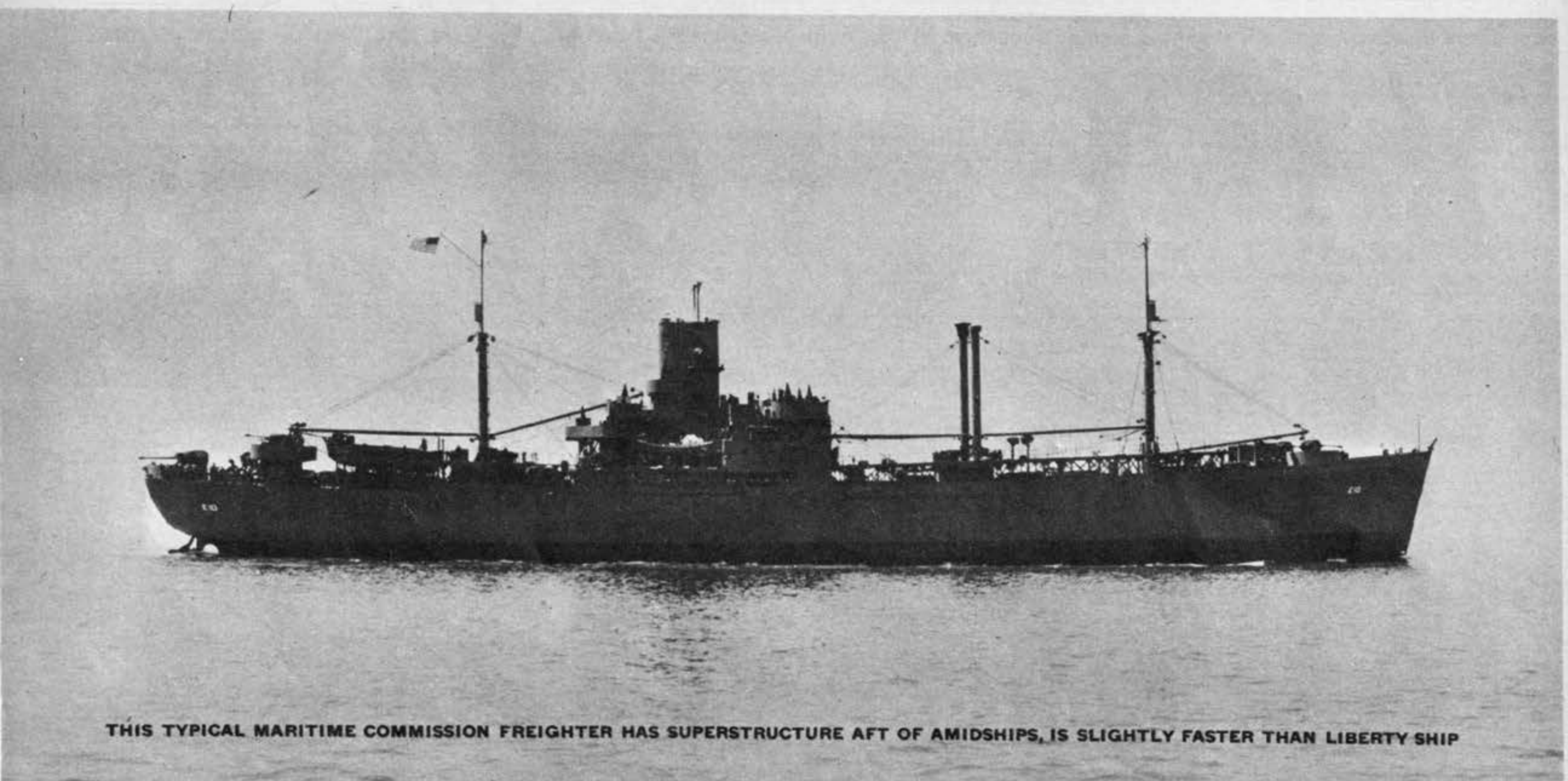
**THE JOHN C. CALHOUN,** a Liberty ship, has a composite superstructure housing crew and navigation bridge. A catwalk and small temporary decks have been set up to allow crew to pass over deck cargo. Three heavy kingposts support several booms each, two have stepped-on topmasts.

**U.S.S. AQUILA,** an attack-cargo vessel, is a modern Danish freighter capable of a speed of 13 knots, used to carry equipment for landing operations.

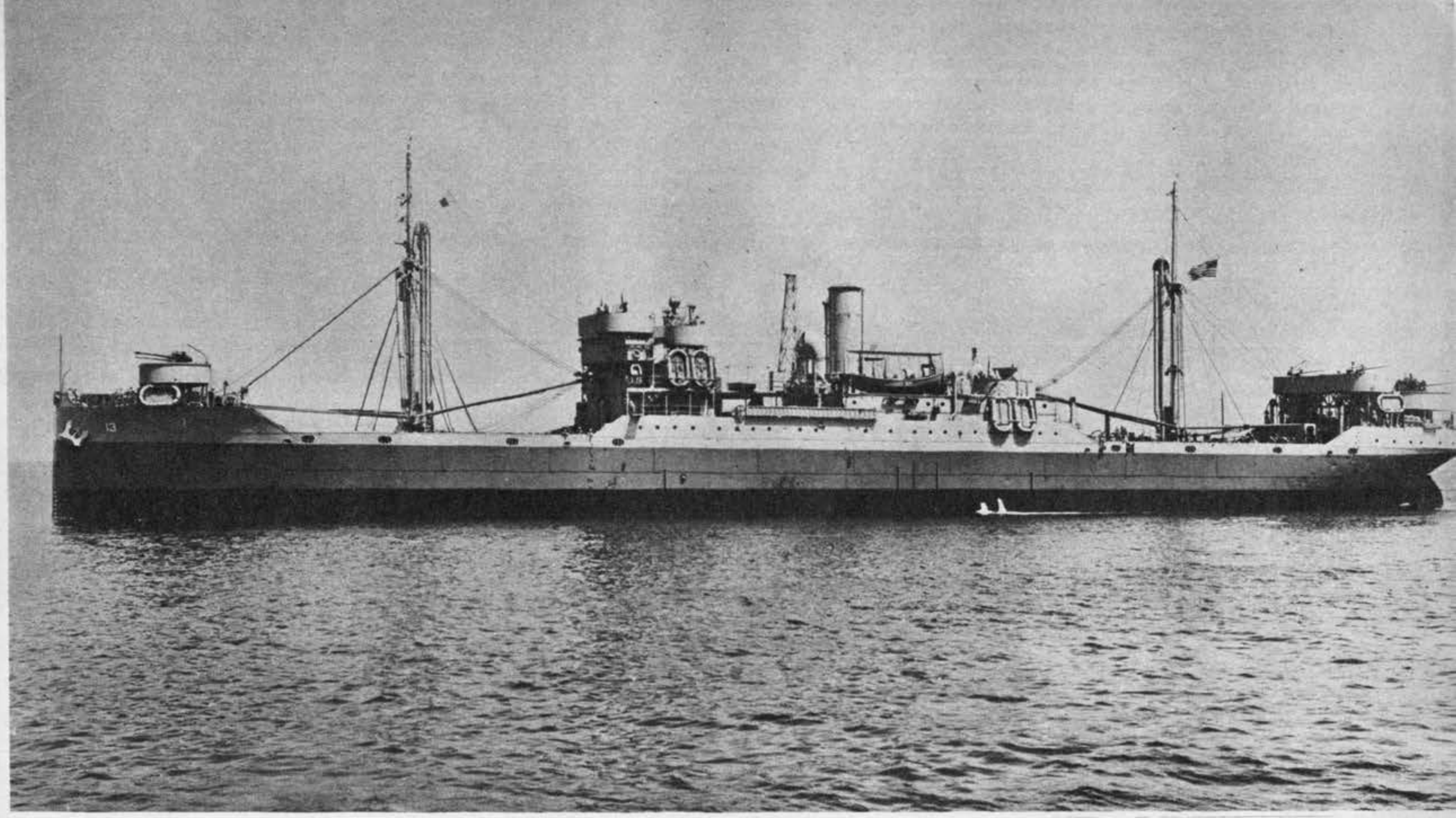
# CARGO SHIPS

## Backbone of the merchant fleet

Most numerous and important ship of the Merchant Marine is the slow-and-steady pack-horse freighter which bears the brunt of war transportation on hazardous convoy journeys that take half again as long as in peacetime. All ship shapes and sizes make up the cargo fleet, from old tramps to sleek new steamers. A small superstructure housing the crew is located amidships and is sometimes of split construction with bridge and engines separate. Stalwart kingposts and cargo booms deposit the load in the hold



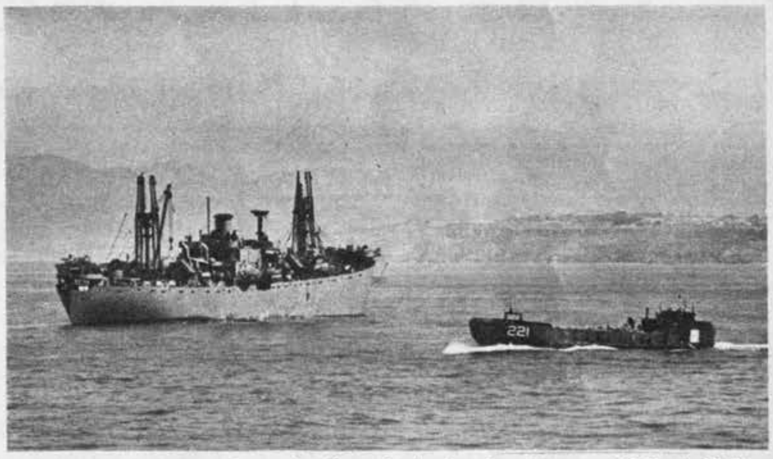
**THIS TYPICAL MARITIME COMMISSION FREIGHTER HAS SUPERSTRUCTURE AFT OF AMIDSHIPS, IS SLIGHTLY FASTER THAN LIBERTY SHIP**



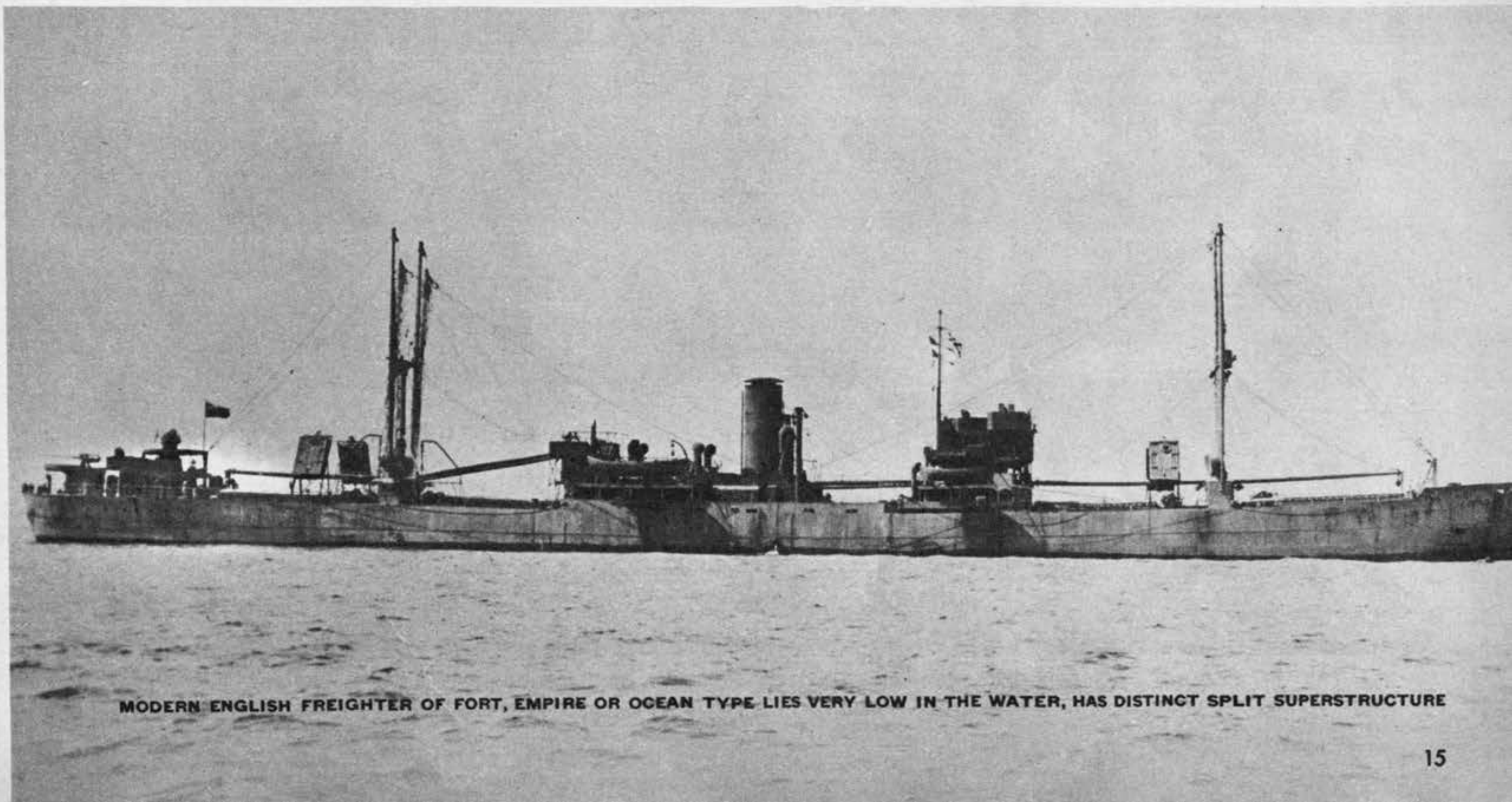
**SPLIT SUPERSTRUCTURE,** with bridge and engine rooms separate, appears on Hog Island freighter, one of which was launched every four hours of World War I. In this war she is covered with anti-aircraft cannon. Angular counter stern, sharp lines of well decks and plumb bow are typical.

through large hatches on the deck. In normal times cargo is all stowed below but now, to increase capacity, some material is piled on the weather deck.

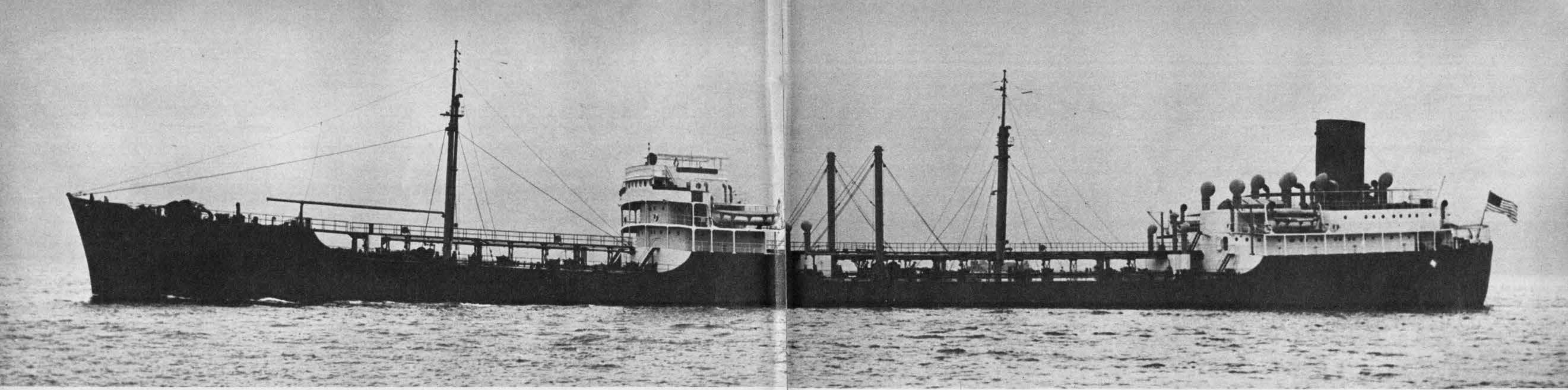
The United States is the biggest builder of cargo vessels, although ten years ago we did not have ships enough to carry more than a third of our foreign trade. Mass-produced Liberty ships and other Maritime Commission designs have been our answer to Allied war losses. Designed in close collaboration with the Army and Navy, these new ships are readily adaptable for use as fleet auxiliaries. The hard-working Liberty ship now carries about one quarter of all United Nations tonnage. Fifteen of these ships are needed to transport the equipment of a single armored division. To keep that division supplied with its daily requirements of 650 tons of gasoline, 600 tons of ammunition and 35 tons of food necessitates the arrival of a Liberty ship every eight days of the war.



**LIBERTY SHIP** awaits unloading during bombardment of Gela in Sicily. This pre-fabricated vessel has flush deck, attains speed of about 10 knots.



MODERN ENGLISH FREIGHTER OF FORT, EMPIRE OR OCEAN TYPE LIES VERY LOW IN THE WATER, HAS DISTINCT SPLIT SUPERSTRUCTURE



**ESSO NEW ORLEANS, NOW THE FLEET'S CHENANGO, ONCE SAILED AROUND THE WORLD FOR STANDARD OIL COMPANY. HER CATWALK RUNNING FORE AND AFT IS EASILY VISIBLE. BRIDGE IS AMIDSHIPS AND ENGINES AFT. BUILT IN 1939, THIS TANKER HAS MODERN RAKED BOW AND CRUISER STERN**

# TANKERS AND COLLIERS

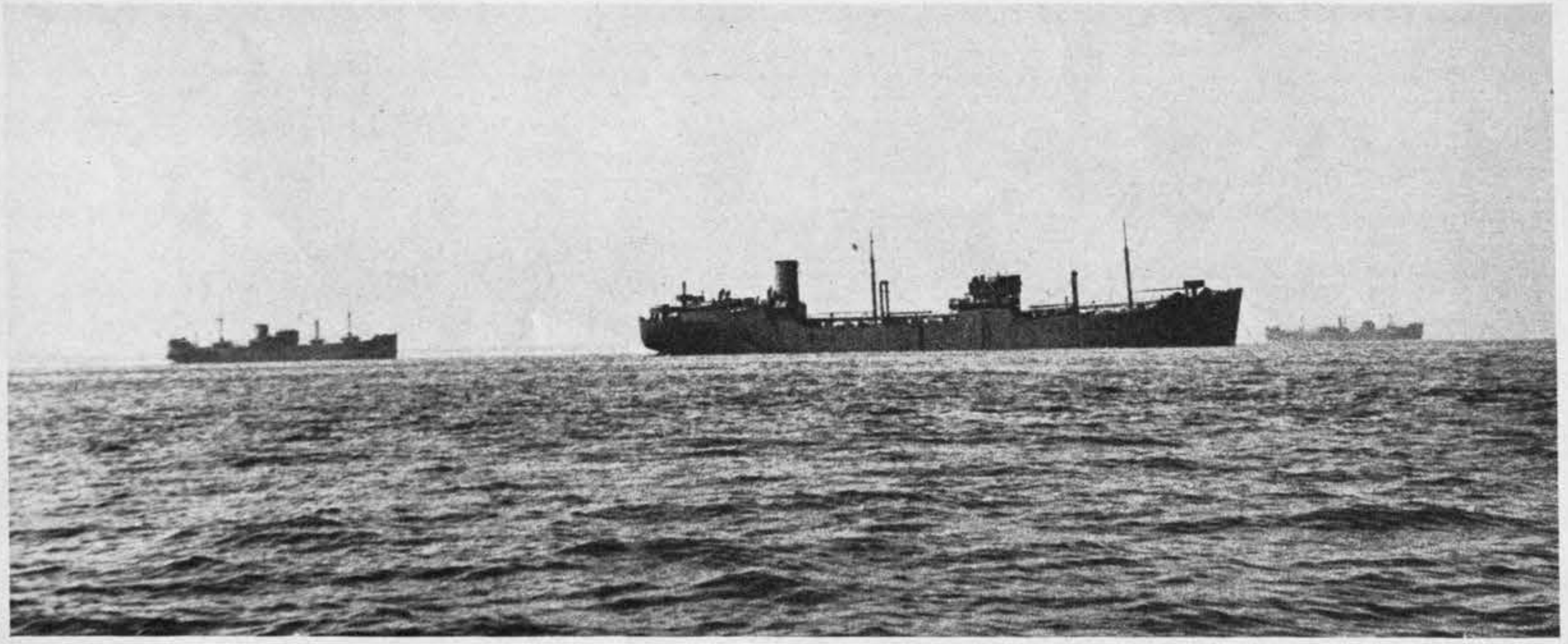
## The fuel that keeps the United Nations fighting is carried thousands of miles

The bombardment of Germany would stop today were it not for the priceless loads of oil and high-octane aviation gasoline carried by merchant ships. The tough, nerve-racking job that tanker crews have sailing their 10-knot vessels through sub-infested waters is an heroic story of the war.

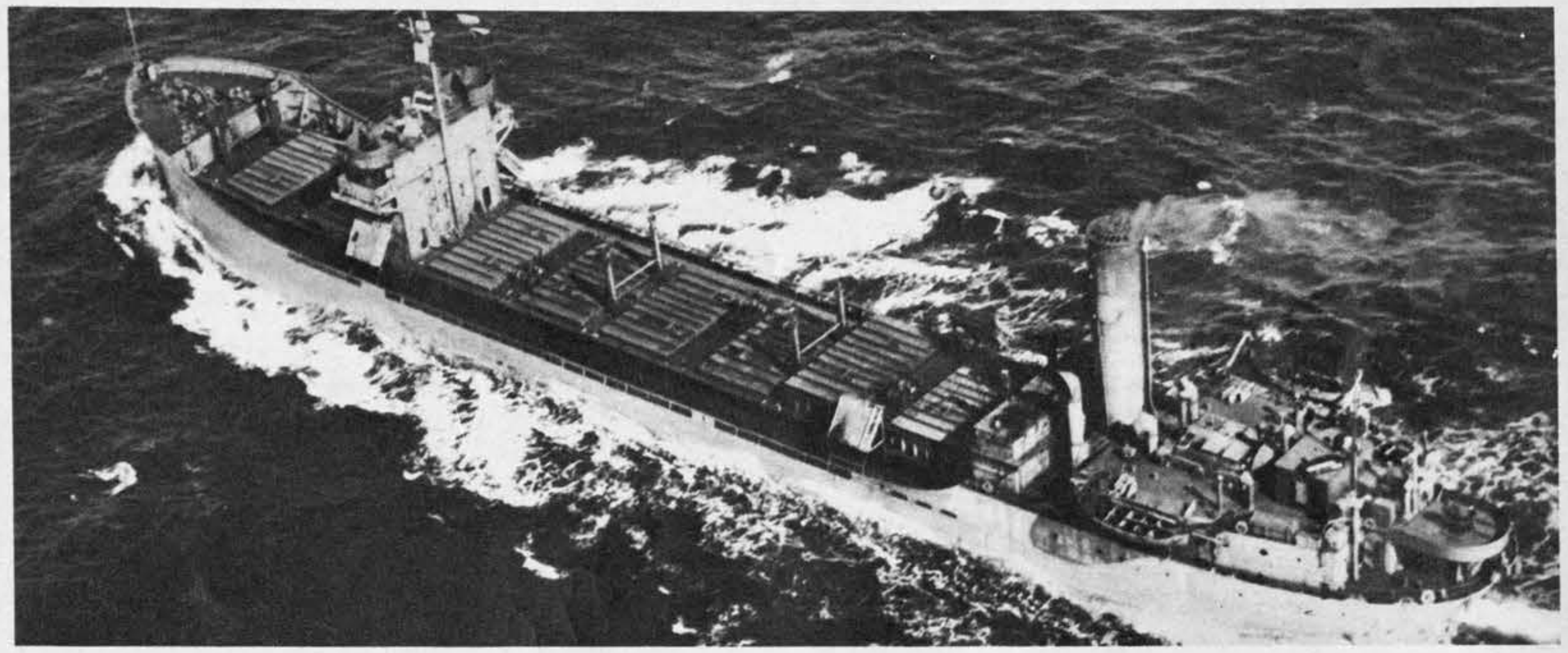
Tankers ride low in the water, their holds filled with crude oil, gasoline and kerosene. Bulkheads prevent shifting of cargo in a rough sea. Weather deck of a loaded tanker is almost constantly awash, and an elevated catwalk running fore and aft is necessary. Engines are aft for safety's sake, and heavy cargo gear is generally absent. On larger tankers, bridge is located amidships.

Faster tankers, with greater than "fleet speed," are part of our Maritime Commission building program. Traveling with the fleet as naval auxiliaries, tankers can refuel warships on the move. The Japanese in the 1930's built a number of fast, 18-knot tankers, probably with the war in mind.

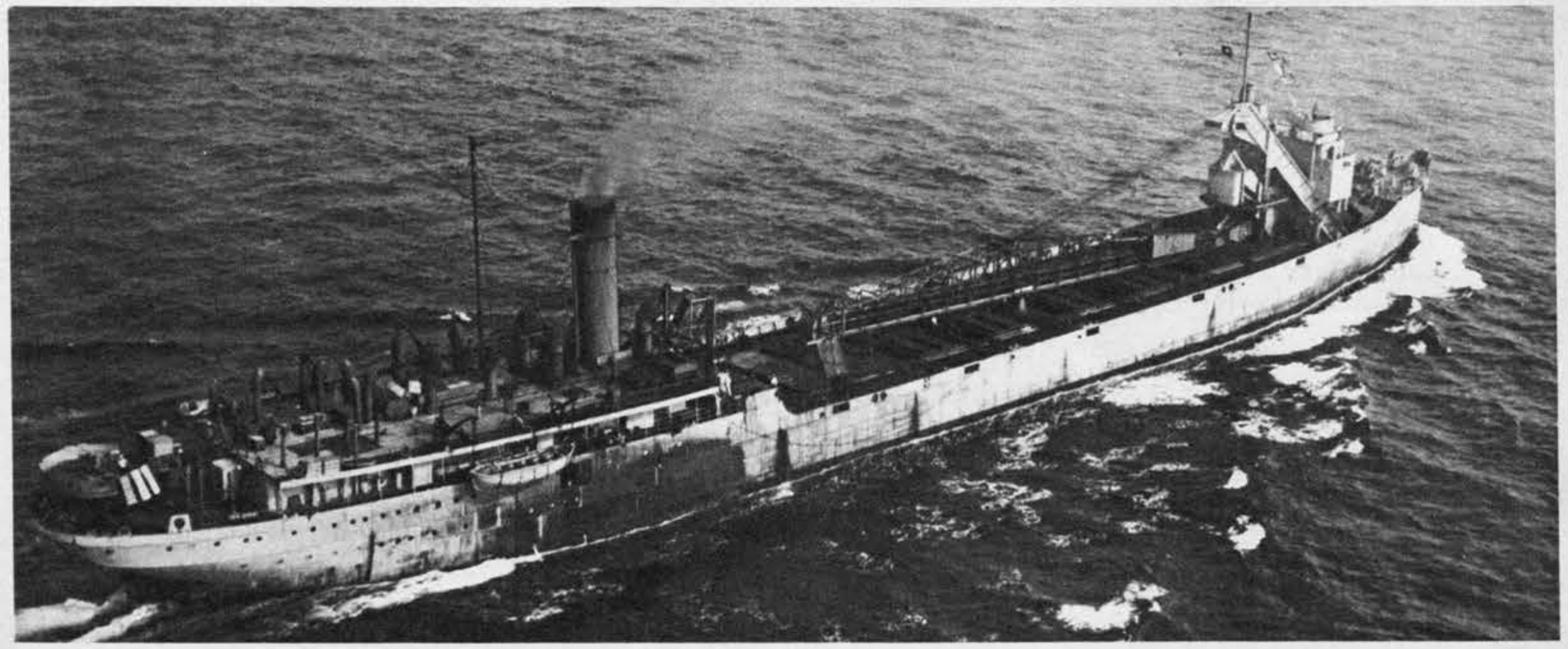
Engines-aft cargo types, like tankers, are built to carry bulk cargo in compartments in the hold, but collier cargo is dry rather than liquid, consisting of coal, ore or grain, often timber, etc. Many large cargo hatches appear on the weather decks of colliers together with a number of short heavy kingposts to lift the cargoes. Engines are often aft. The bridge is amidships, aft or forward. Some cargo types are loaded by pier machinery; others, like the one at bottom right, have cranes of their own for self-loading. The chief difference in appearance between tankers and cargo carriers is the absence of catwalk and prominence of loading gear in the latter.



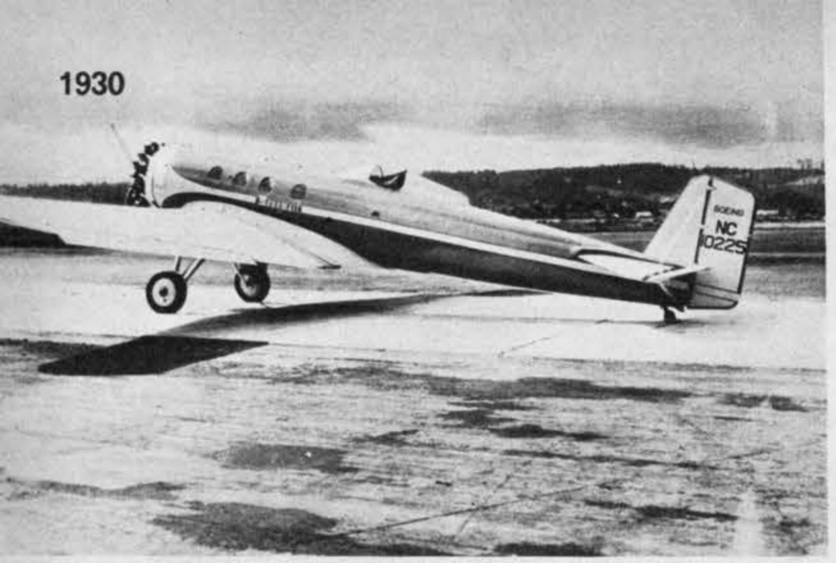
**U.S. OIL TANKER** with well deck, riding light at anchor, stands high out of the water. Her bridge is just forward of amidships, engines are aft. Two tall masts for signaling equipment stand on either side of bridge. Raking bow and cruiser spoon stern show that vessel is of a fairly new design.



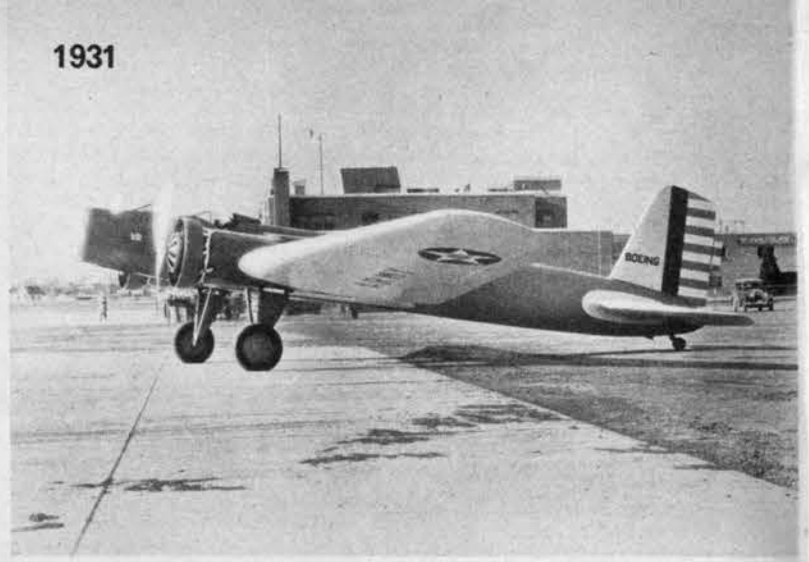
**BERWINDVALE**, a pier-loading collier, has its engine aft, bridge structure forward of amidships. Between these two prominent recognition points is a long expanse of well deck interrupted only by kingposts. Hatch covers are large for easy handling of bulk cargoes like grain and coal, metal ores.



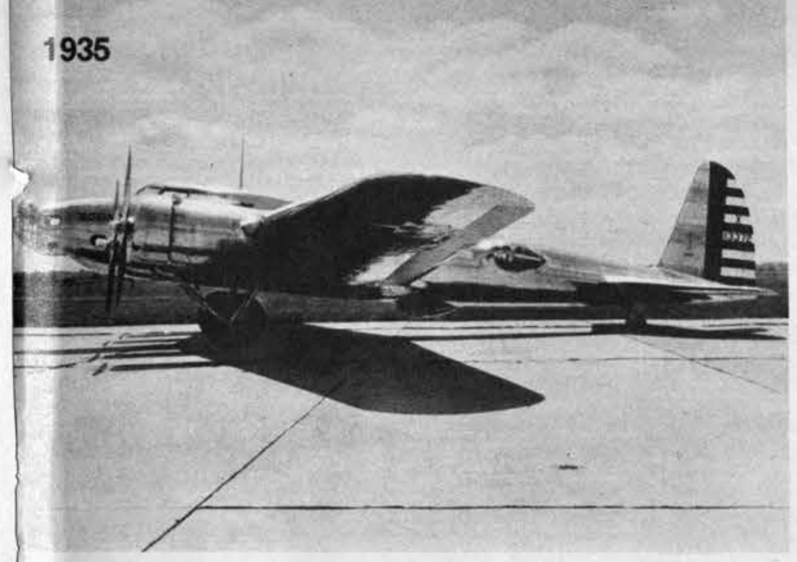
**THE ACHILLES**, a self-loading collier, has a long crane thrusting out over rows of hatches on the weather deck. The bridge is forward, engines are aft. Crew quarters above the engines are unusually large. The tall, thin funnel shows that the Achilles burns coal. She has a marked spoon stern.


1930

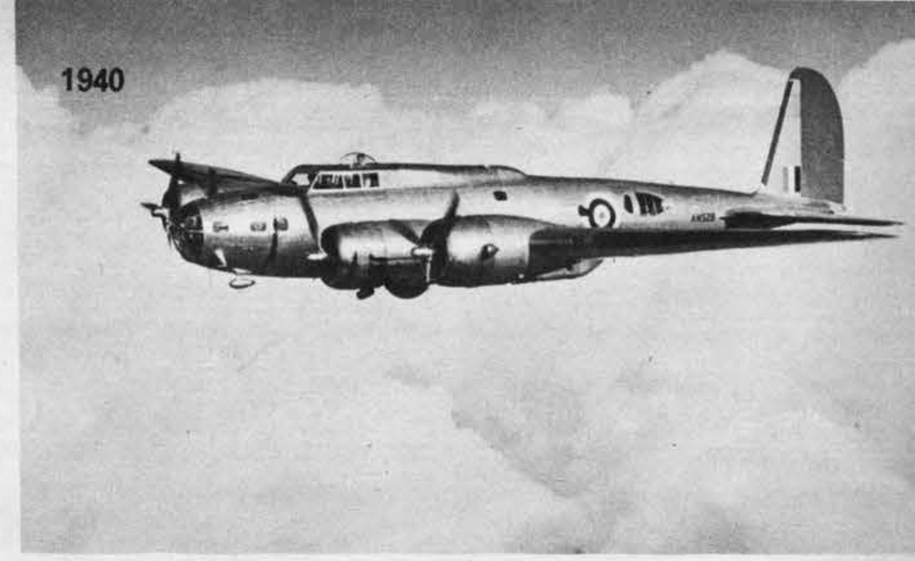
**BOEING MONOMAIL** served either as a mailplane or transport. The outline of its long, sleek fuselage was carried over into later Boeing airplanes.


1931

**PIONEER HEAVY BOMBER,** B-9 resembled Monomail in basic design of wing and tail but had machine-gun position projecting beyond engines.


1935

**"PROJECT 299,"** built over eight years ago, has unmistakable Flying Fortress airframe. Note side and belly blisters, indentation under nose.


1940

**RAF's B-17C** had flat panels in place of blisters and "bathtub" gun position under fuselage. It was first of the B-17's with smooth nose contour.

# AIRPLANE GENEALOGY

## Development of airplane families gives valuable recognition clues

Automobiles were very easy to recognize in the late twenties. Each manufacturer had his set of doodads, and before streamlining came along to take away the square corners and distinctive hoods, every kid on the block was a recognition expert. But streamlining by no means made it impossible to recognize cars; radical changes took place, but individuality survived.

Accompanying the modernization of design was a series of mergers which resulted in "families" of cars. The result was that one could sometimes tell who built a car before getting close enough to give the exact make.

To some extent the same sort of family grouping has become apparent in the development of aircraft. The cluttered designs have given way to cleaner, more uniform models, and hard and fast military necessities allow little leeway in placing engines, turrets and cockpits. Nevertheless, family features survive, and even to the relatively untrained eye, the distinctiveness of a part like the Bristol fin and rudder (December *Journal*, page 40) is obvious.

Any system of recognition depending on a search for family features is likely to be bad, for it would contradict the principle of seeing the plane as a whole. But when positive identification is impossible at first glance, the pilot or gunner is very likely to start grasping at clues such as the shape of the nose, the fin or a nacelle. At this stage a knowledge of family features can help enormously.

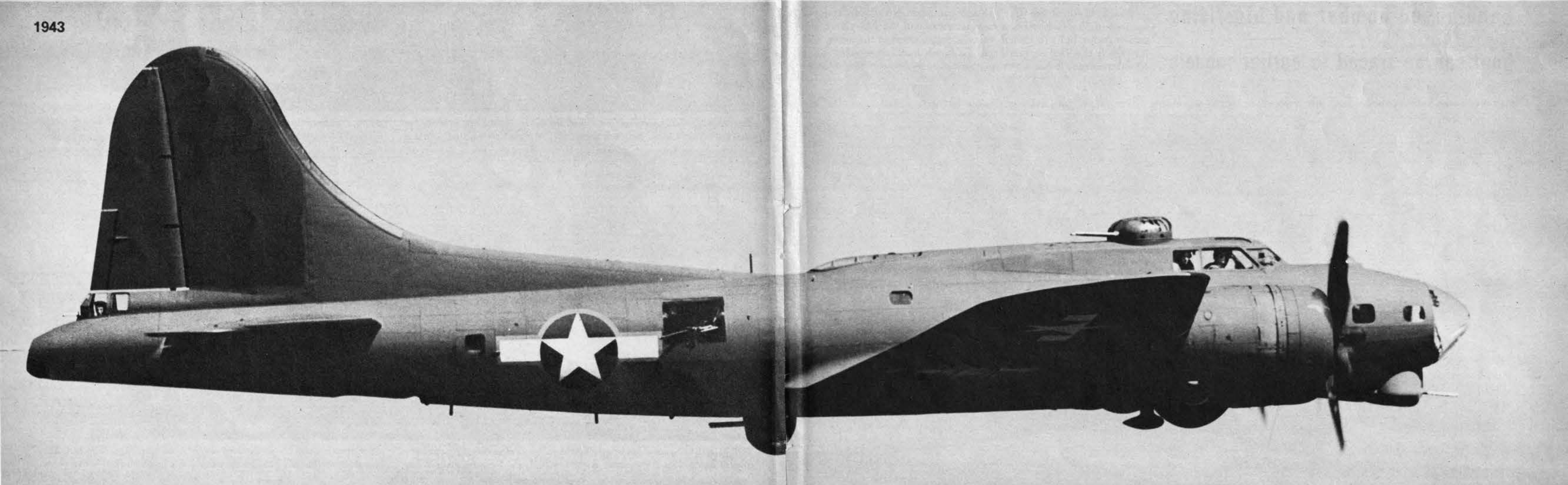
It must not be assumed that manufacturers keep family features in all of their planes. But familiarity with the developments shown on the following pages may add materially to one's interest in recognition.

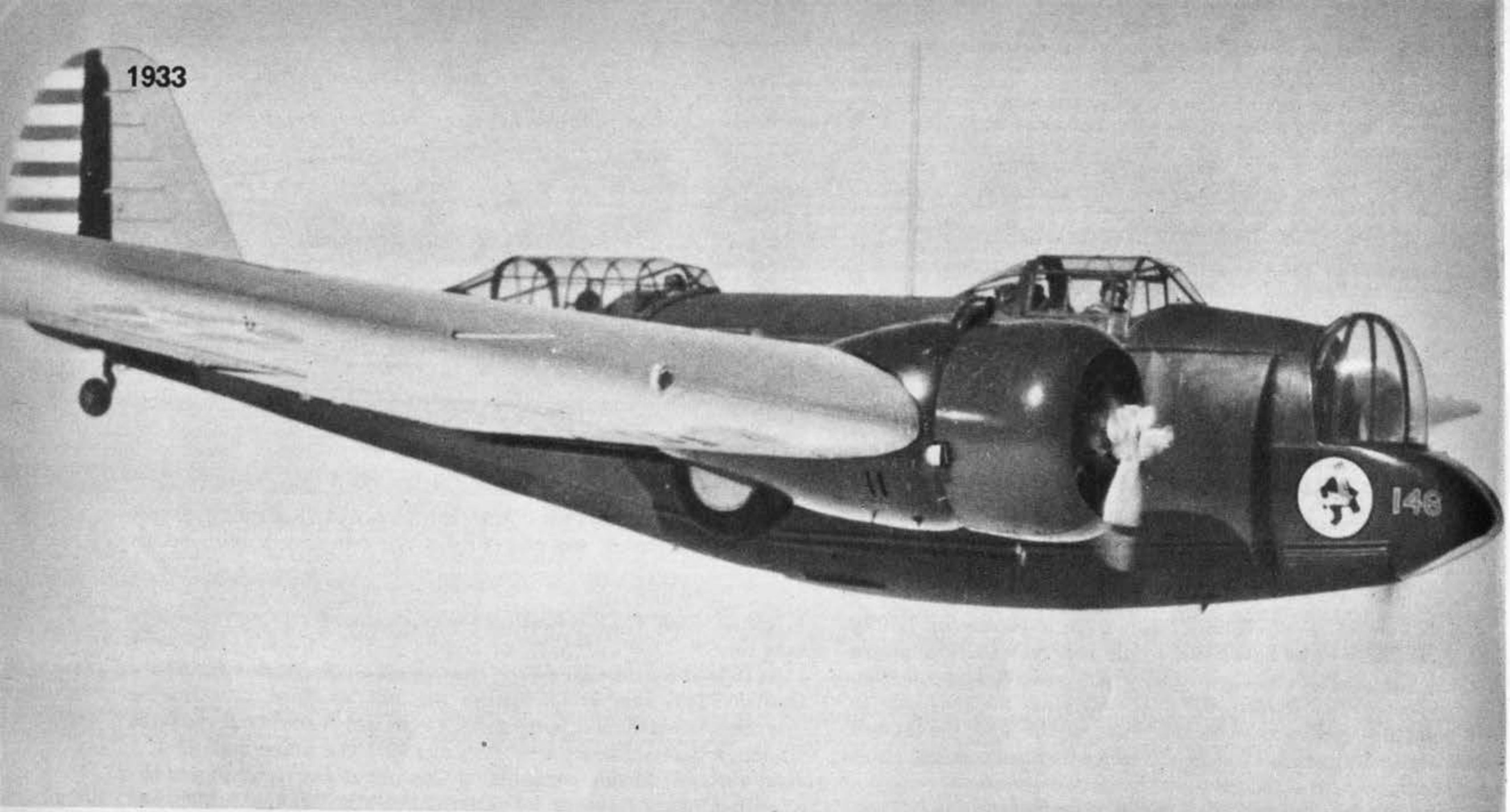
Typical in the history of airplane design has been the evolution of the Boeing B-17G. First plane recognizable as its ancestor was the Monomail, a heavy monoplane designed in 1928–29. Built for speed, it had the long, sleek fuselage which has characterized the entire Fortress series. Logical military successor to the Monomail was the B-9 which appeared in 1931. It did 186 miles per hour at a height of 6,000 ft., a sensational performance for heavy planes of that time.

In 1934 the Army Air Corps announced a competition for a new bomber. The number of engines was not specified, and Boeing engineers decided on a four-engine plane which could out-perform all competitors. Known as "Project 299," the plane first flew in July, 1935. Although it crashed in October as the result of a take-off with a locked elevator, its performance was such that additional four-motored Boeings were ordered.

With its assortment of blisters and its smaller fin, the 299 is, in the military sense, a far cry from the well-armed B-17G. Perhaps the most important transition was from D to E. since it meant redesigning the whole tail structure to house a gun turret and adding other turrets on the back and belly. But through all the developments which have added armor, horsepower and firepower to the B-17, the basic airframe has been retained. The forthcoming Boeing bomber, B-29, will be predicated on the same fundamental design.

WITH 13 MACHINE GUNS, EIGHT OF THEM IN TURRETS, BOEING'S LATEST HEAVYWEIGHT, THE B-17G, IS POTENT THREAT TO GERMAN AND JAPANESE FIGHTERS. INCORPORATING MANY CHANGES RESULTING FROM COMBAT EXPERIENCE, IT DIFFERS SURPRISINGLY LITTLE FROM THE EARLY FORTRESSES


1943



DELIVERED TO THE ARMY IN 1933, B-10'S WERE STANDARD EQUIPMENT AS LATE AS 1939 WHEN THEY SERVED AS PART OF PANAMA CANAL DEFENSE

# MARTIN AND CONSOLIDATED

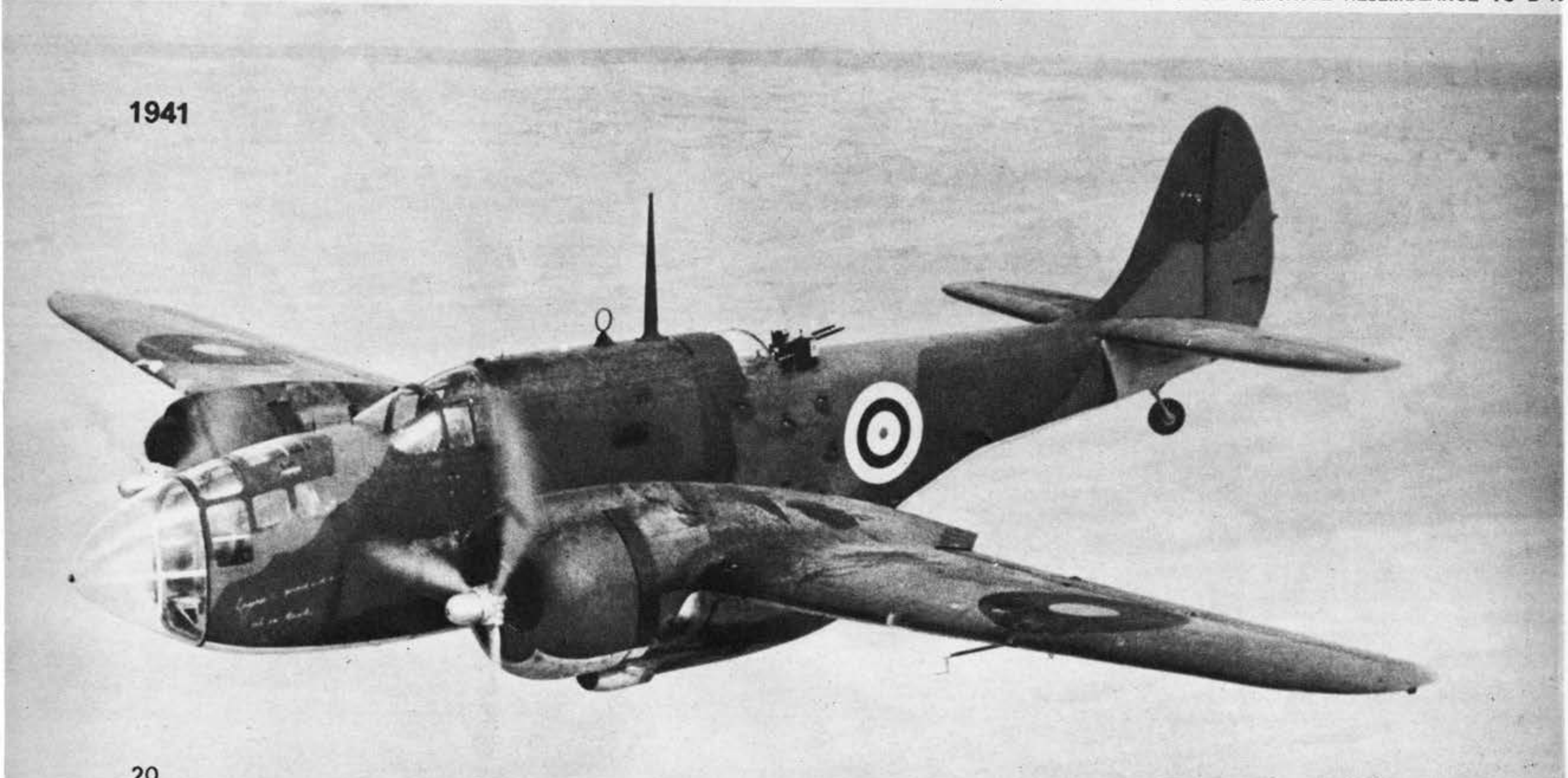
### Land-based bomber and big flying boat can be traced to earlier models

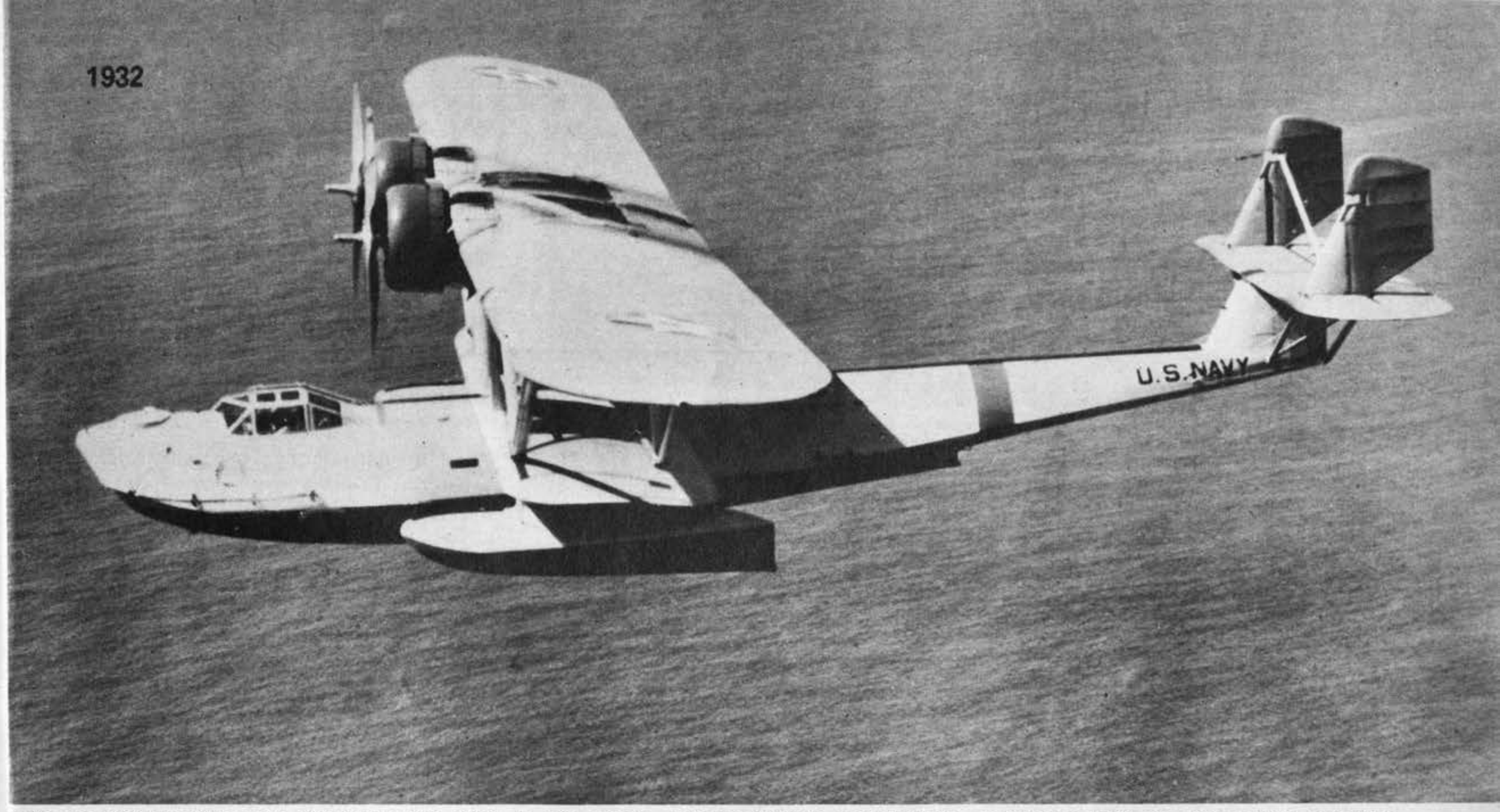
Light and medium bombers have comprised Glenn L. Martin's greatest contribution in the building of landplanes. Beginning with the XB-907, a steady series was produced including the famous B-10, a later export version, the Martin 139, the 167 or Maryland and 187 or Baltimore.

The B-10, whose prototype was delivered to the Army in 1933, was actually used in combat early in 1942 together with the Martin 139 by pilots of the Netherlands East Indies Air Force. A dozen of these outmoded planes were credited with sinking 26 Japanese ships.

Specific needs of the RAF's desert campaign governed the development of the Baltimore, a heavier version of the Maryland. The earlier plane, built to French specifications, stressed maneuverability which the British sacrificed for bomb load. Successful in the Mediterranean, it has been used almost exclusively in that theater.

BALTIMORE WAS TEST FLOWN IN JUNE 1941, TWO YEARS AFTER MARYLAND. DEEP BELLY, TAIL ASSEMBLY SHOW DEFINITE RESEMBLANCE TO B-10



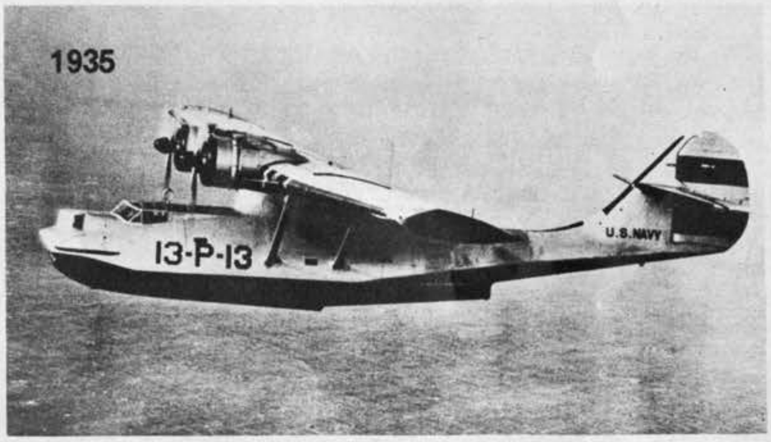


FIRST OF SESQUIPLANE TYPES, CONSOLIDATED P2Y-1, IS 1932 MODEL. NACELLES WERE UNDER WING, NOT BUILT INTO IT. NOTE TWIN RUDDERS

Consolidated flying boats now serving the U. S. Navy and RAF Coastal Command date back to 1928 when the PY-1 was delivered to the Navy. Originally a monoplane, this ship went through the sesquiplane stage (*above*) with a small lower wing at the top of the hull. It finally emerged as a parasol-wing monoplane with a single fin and rudder.

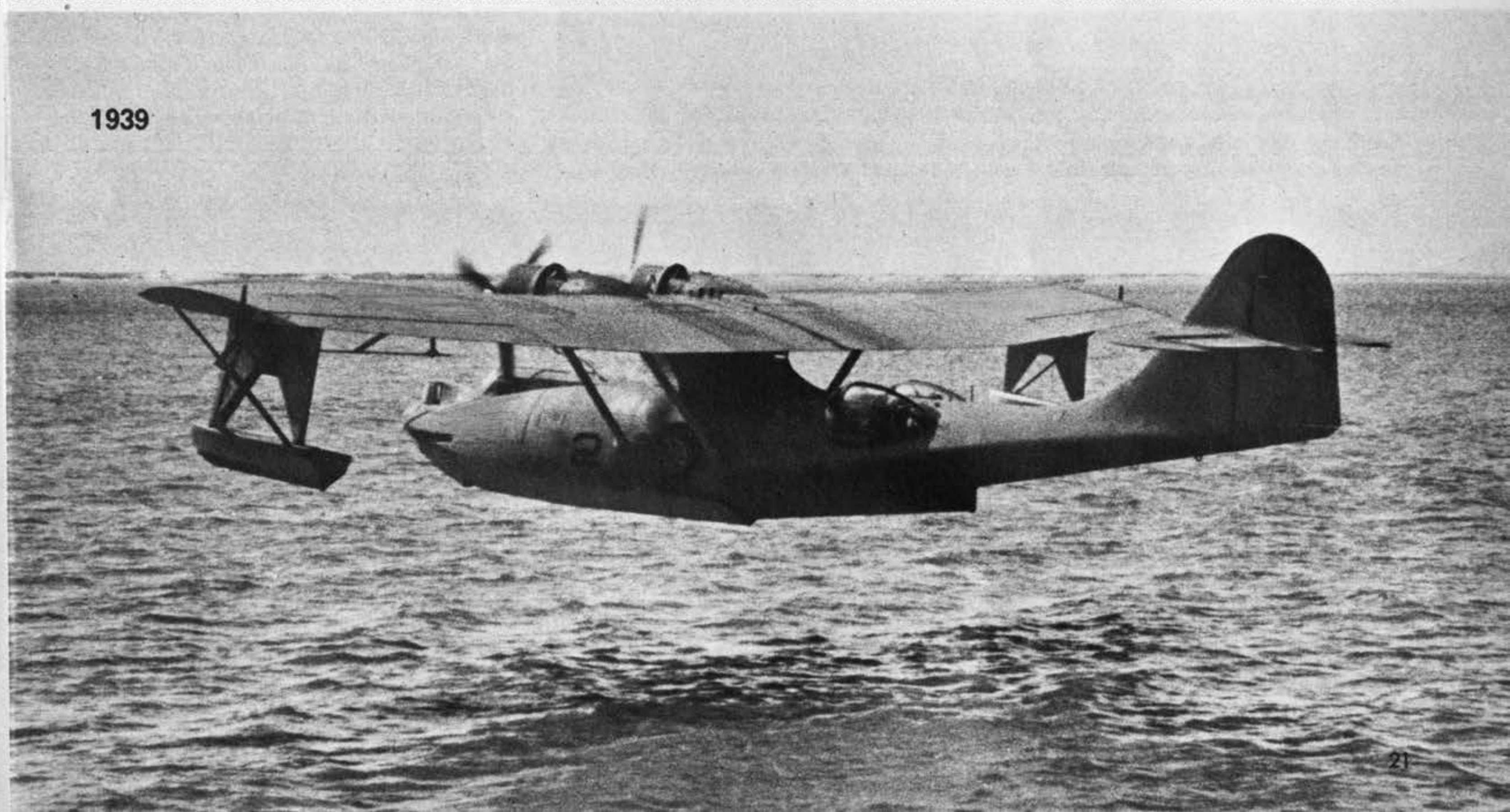
In 1933 the Consolidated boats flew 2,039 miles non-stop to break the existing straight-line distance record for seaplanes. Among other PY and PBY records are the first formation flight from San Francisco to Honolulu (January 1934) and another distance record of 3,443 miles from Norfolk to San Diego via Coco Solo (1935), this last by the PBY-1 prototype.

Appearing in 1938, the PBY-4 was longer, heavier than its predecessors and was first to have blisters. The model now in use is the well-known Catalina, PBY-5. Amphibian version is the PBY-5A.



**PBY-1** could very easily be taken for the latest Catalina. Nose resembles that of P2Y-1 and high stabilizer survived in switching to the single tail.

PBY-5'S SIDE BLISTERS PACK STRONG DEFENSIVE PUNCH. RETRACTABLE FLOATS BECOME WINGTIPS WHEN LONG-RANGE CATALINA IS IN FLIGHT



# HAWKER, CURTISS

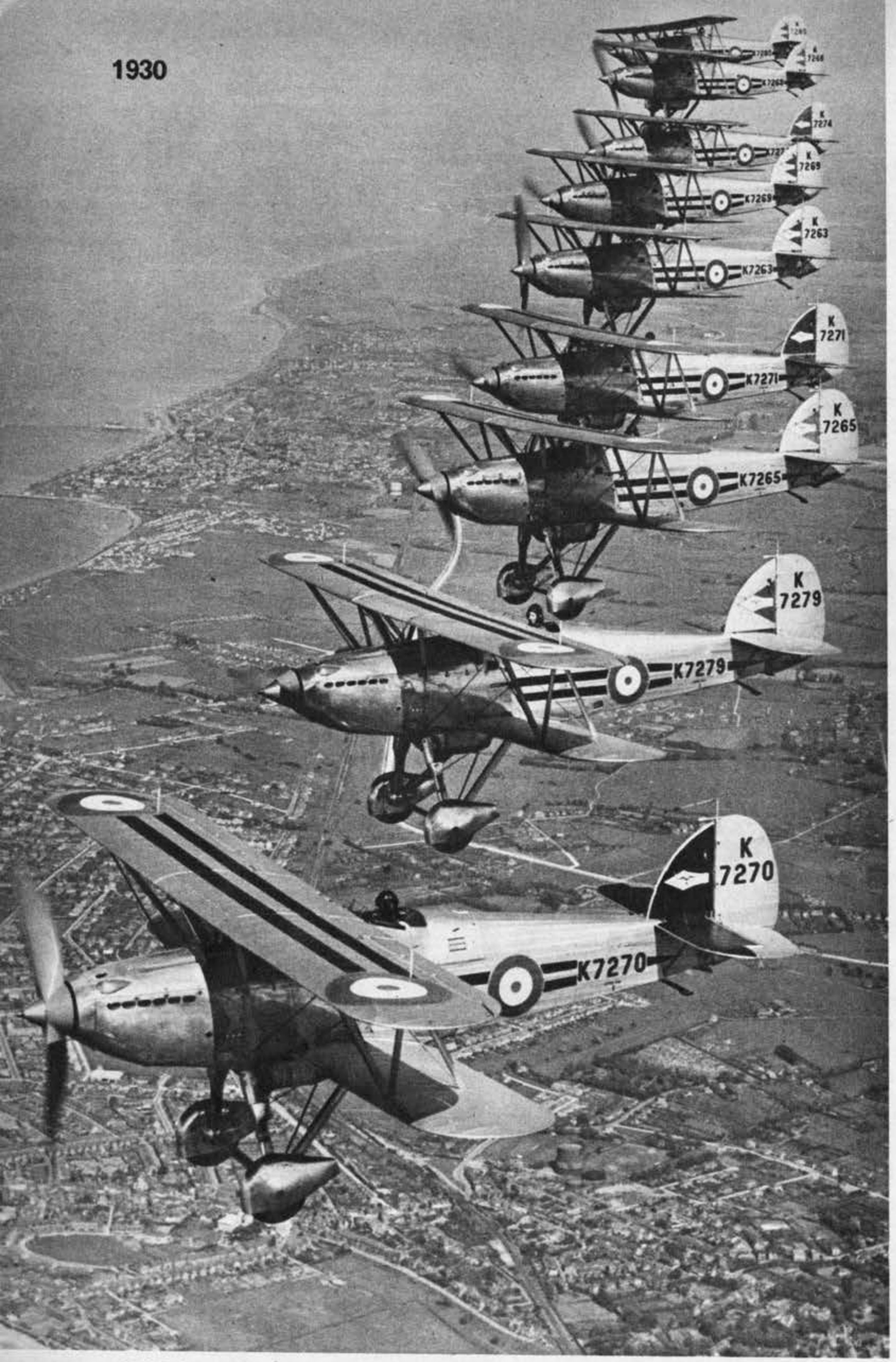
## Typhoon, Warhawk climax two famed fighter lines

The Hurricane and Typhoon, built by Hawker Aircraft Ltd., have a definite link to their common ancestor, the Fury biplane. Despite inevitable changes involved in the production of the first monoplane, the basic fuselage design of the Fury was retained. The Hurricane design crystallized in 1934 when the Merlin engine became available. The prototype was test-flown in 1935. Mainstay of the Fighter Command until Spitfires appeared in quantity, Hurricanes bore the brunt of the fighting in the Battle of Britain.

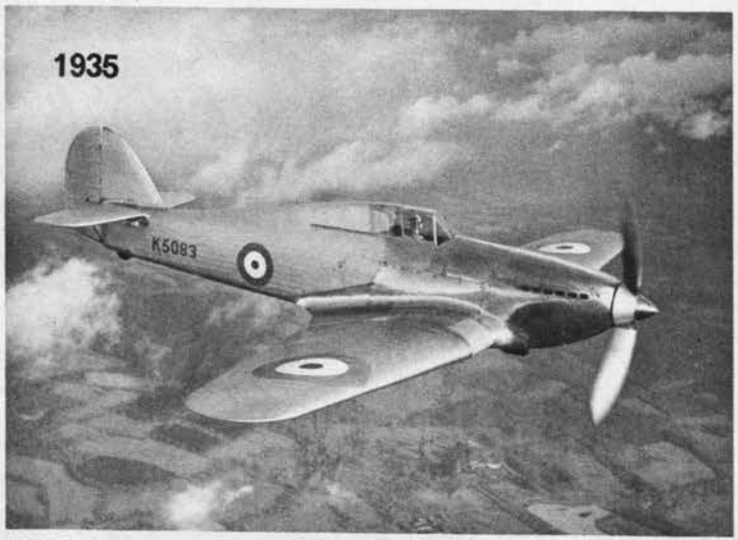
The powerful Typhoon entered combat in August, 1942. As was the case with the Thunderbolt, the plane was designed to exploit a powerful engine, in this case the Napier Sabre. Its huge radiator and the rudder extending below the fuselage give the Typhoon quite distinctive features. Nevertheless, in the outline of the wing and shape of fin and rudder, the influence of the earlier models is clearly apparent.

In the development of the Curtiss series of fighters two noteworthy features are apparent. One of these is the change from a radial to an inline engine. The other is the complete abandoning of one model and a consequent falling back on an earlier design.

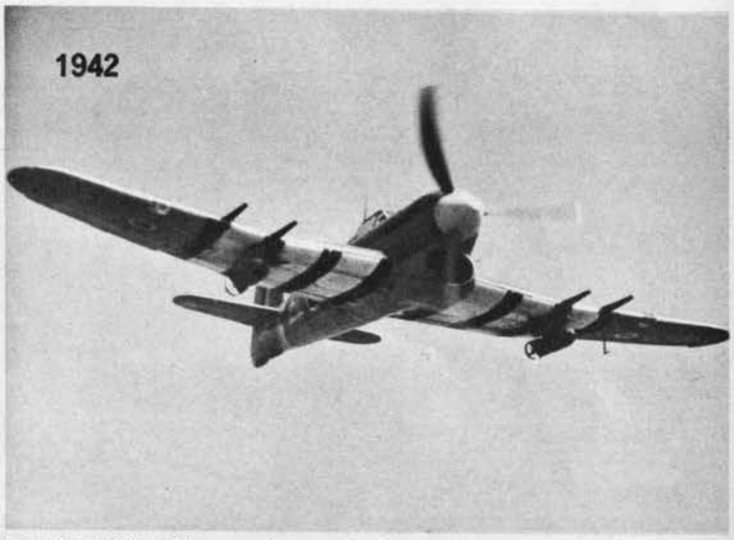
With the trend towards liquid-cooled engines, Curtiss tried a completely new design to house the new Allison and built the P-37 (*right*). When it proved impractical, the P-36 fuselage and wing were used for the installation of the inline engine, resulting in the first of the P-40 series. After this unorthodox start, the subsequent changes to the P-40F (*below, right*) were the logical ones dictated by the need for more firepower, greater speed and ability to perform at considerably higher altitudes.



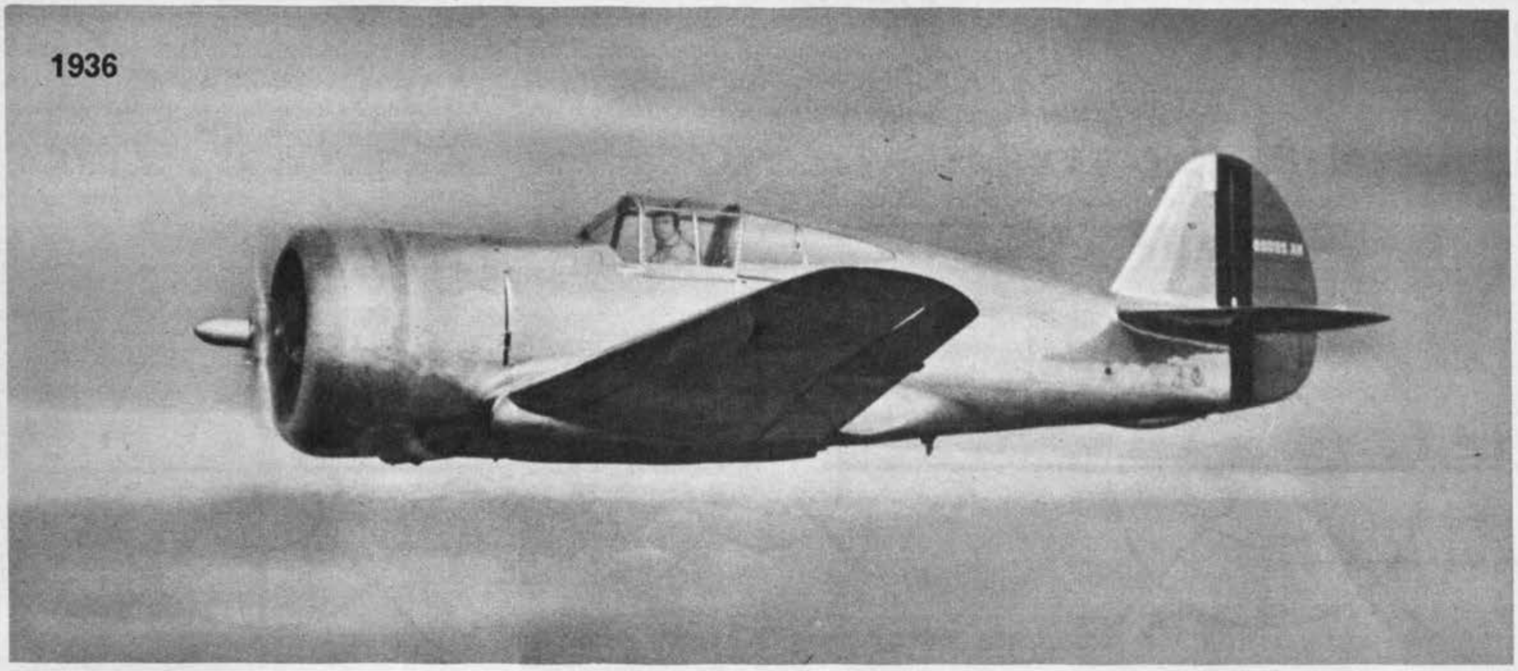
**LAST OF THE BIPLANES** made by Hawker was the Fury. Despite its open cockpit, fixed landing gear, maze of struts and wires, it contained many features of the speedy Hurricane.



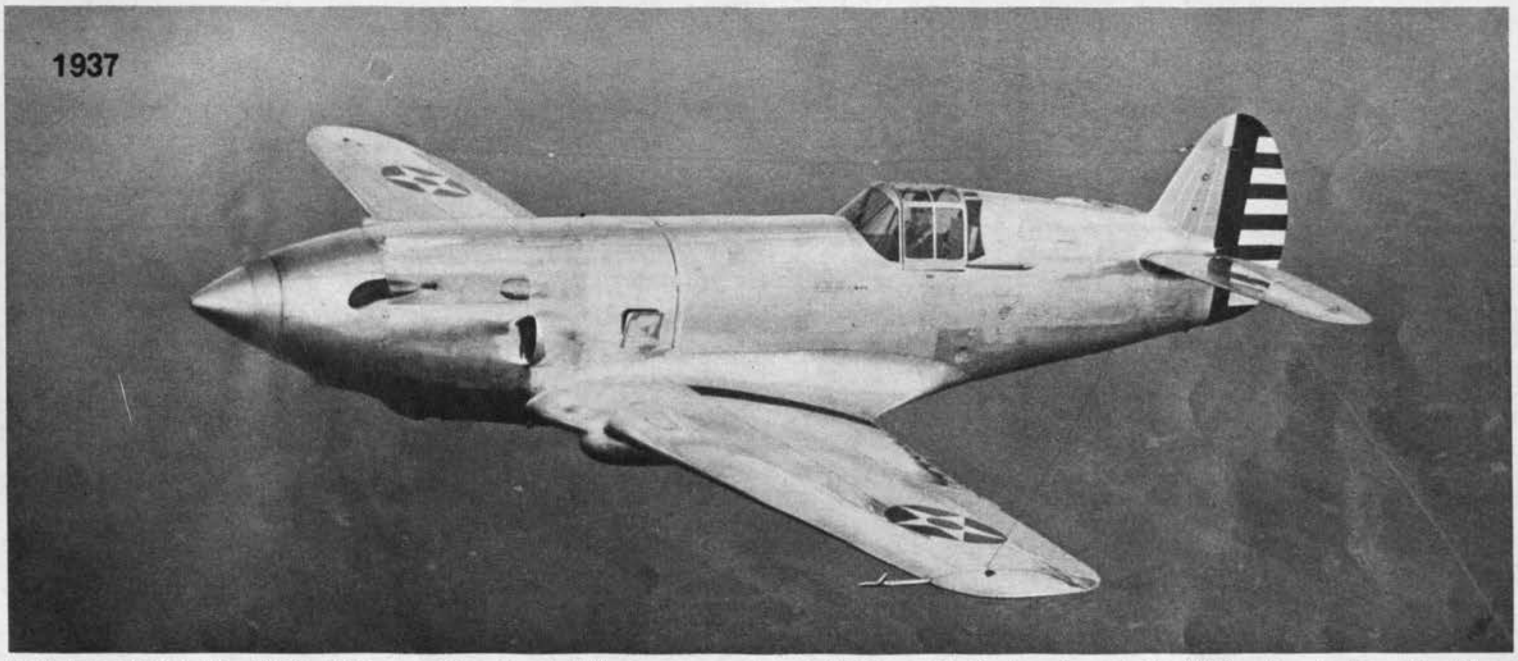
**HURRICANE PROTOTYPE** has characteristic hump, still most prominent recognition feature. Tailplane struts were soon found unnecessary.



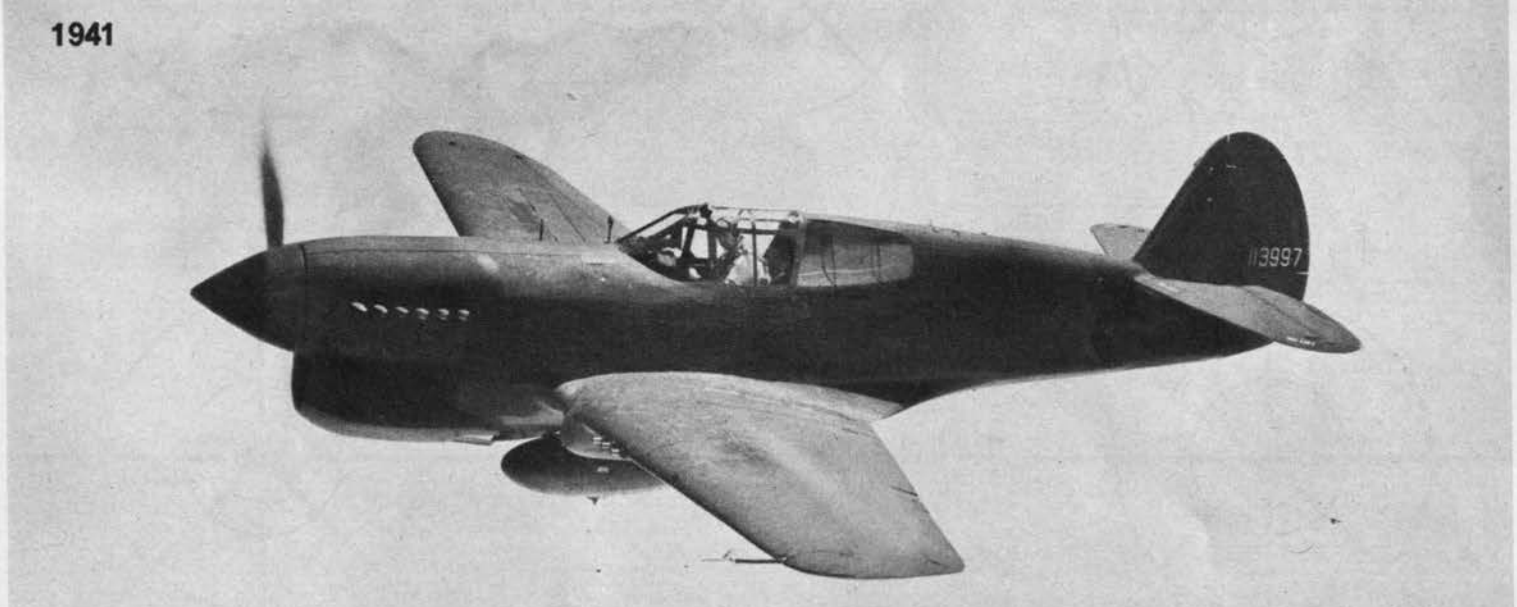
**TYPHOON** in fighter version carries four 20-mm. cannon or 12 .303-cal. machine guns. Speed and ruggedness make it an ideal fighter-bomber.



**STANDARD FIGHTER** of the U. S. Army Air Corps in 1938–39 was the P-36, with single-row radial engine. Its prototype had twin-row radial. P-36 was flown by the French over the Maginot and Siegfried Lines. Switch to liquid-cooled engine was the only major change in the first P-40.



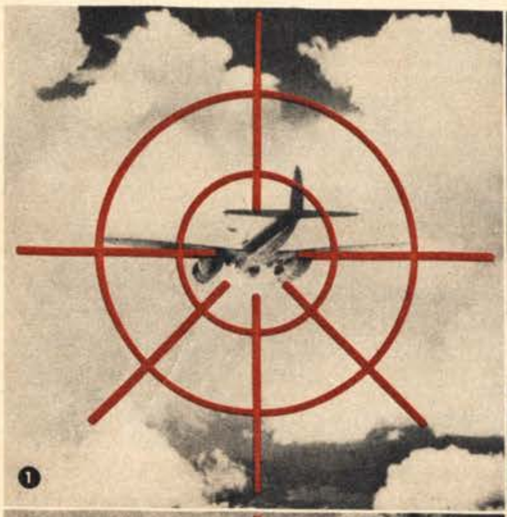
**FREAK SHAPE** of the P-37 with heavy tail and cockpit far to the rear, represented break from the earlier designs, was abandoned after a brief trial. It was the first modern Curtiss fighter plane to have the Allison engine, was also equipped with turbo-supercharger and inner coolers.



**WARHAWK, P-40F,** introduced the Merlin engine to Curtiss series. Also Merlin-powered is P-40L. All other models including P-40P have Allison engine, shallow airscoop atop nose. Representing variations only in details, later P-40 models have not changed from recognition standpoint.

# QUIZ NO. 2
# GUNNERY

This is a fixed gunnery quiz. Like the free gunnery quiz in the December issue of the *Journal*, it is double-barreled. All servicemen should be able to recognize the airplanes. Fighter pilots, trained in the use of the 50–100 mil sight, should be able to tell whether they are in or out of range and just what the range is. For reproduction reasons all the planes are centered in the sight rings. Please note particularly: these pictures do not indicate the correct point of aim position or the correct angle of bank.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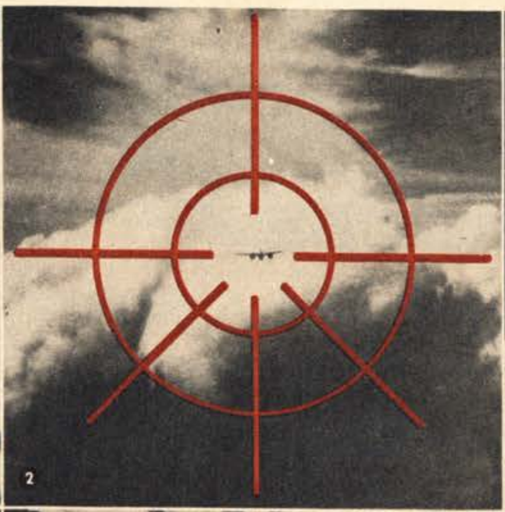
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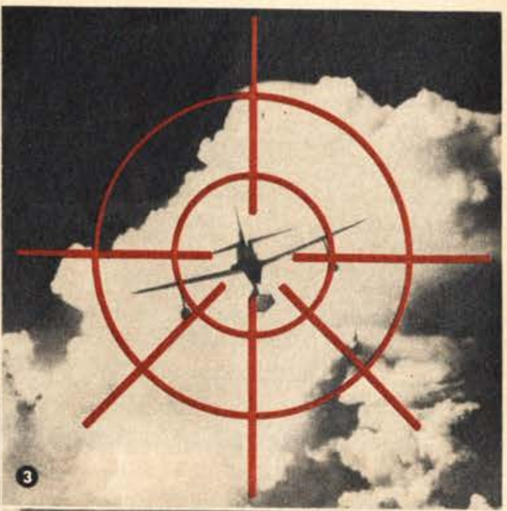
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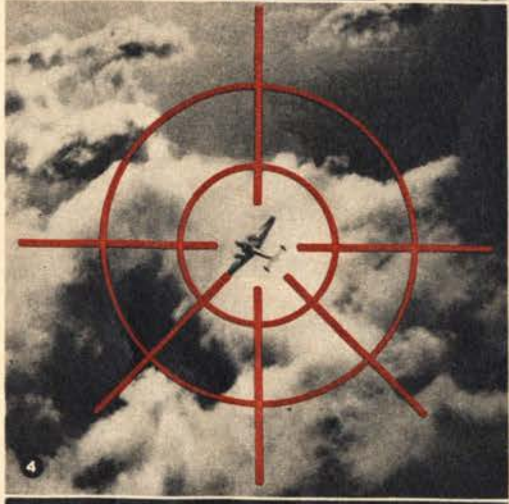
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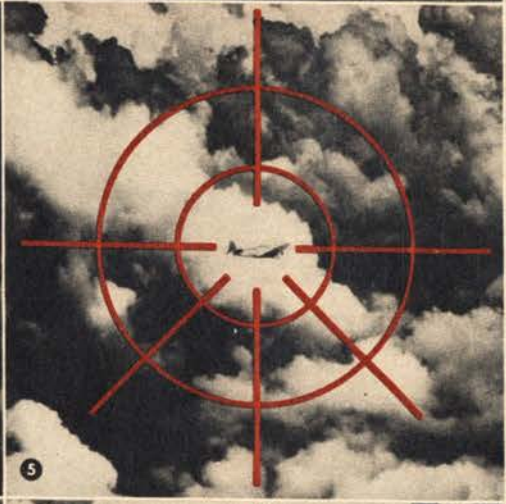
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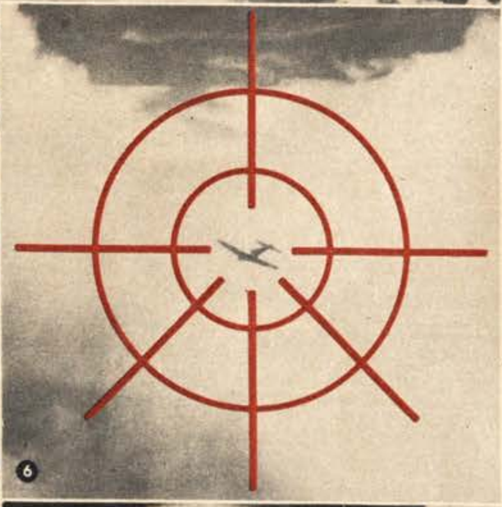
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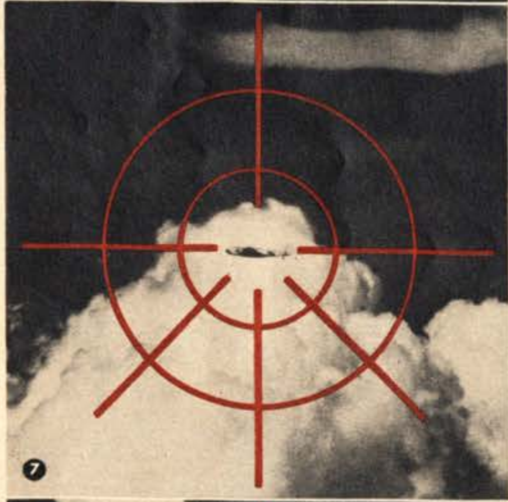
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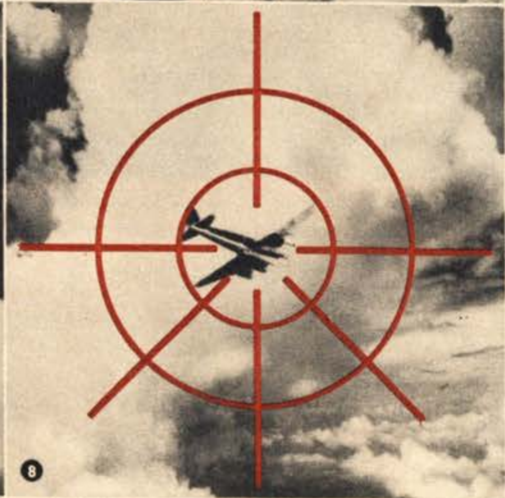
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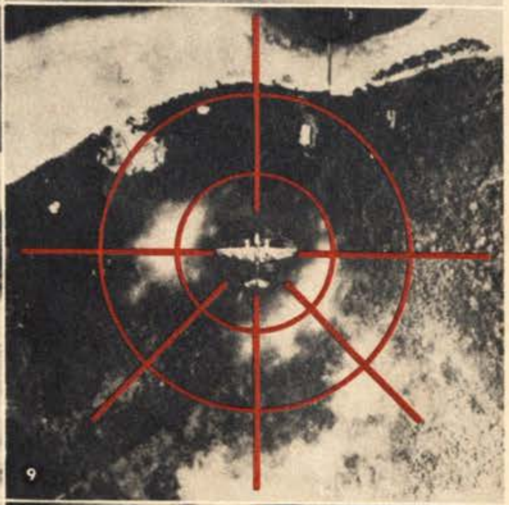
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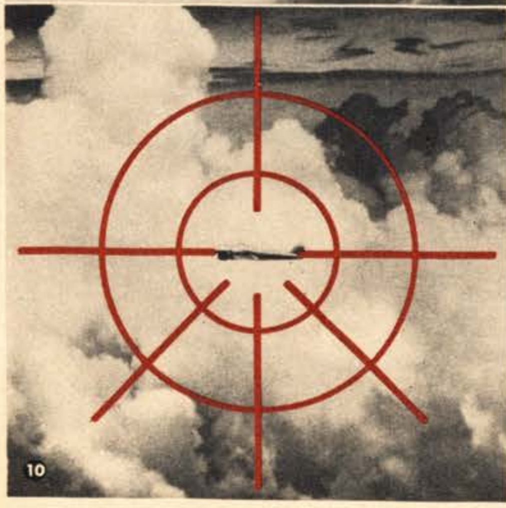
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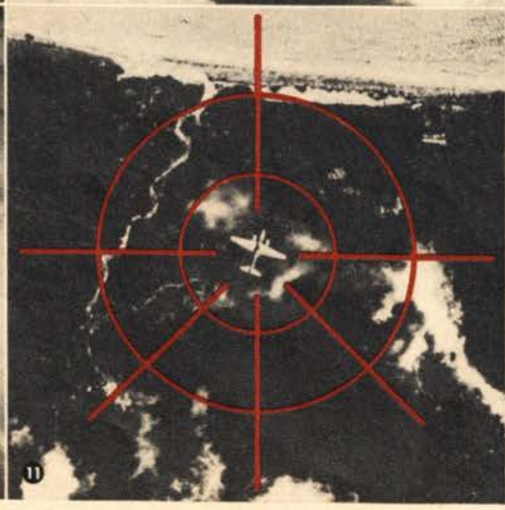
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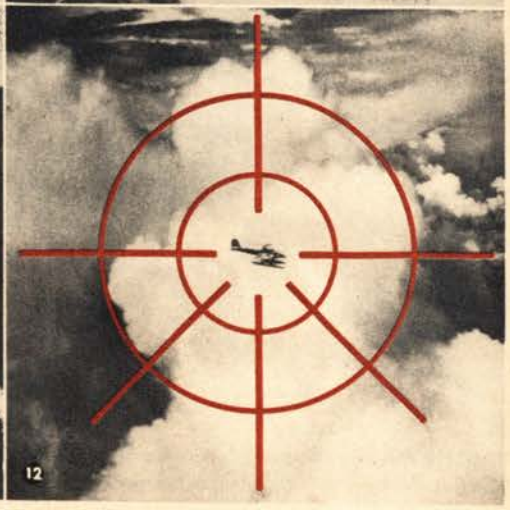
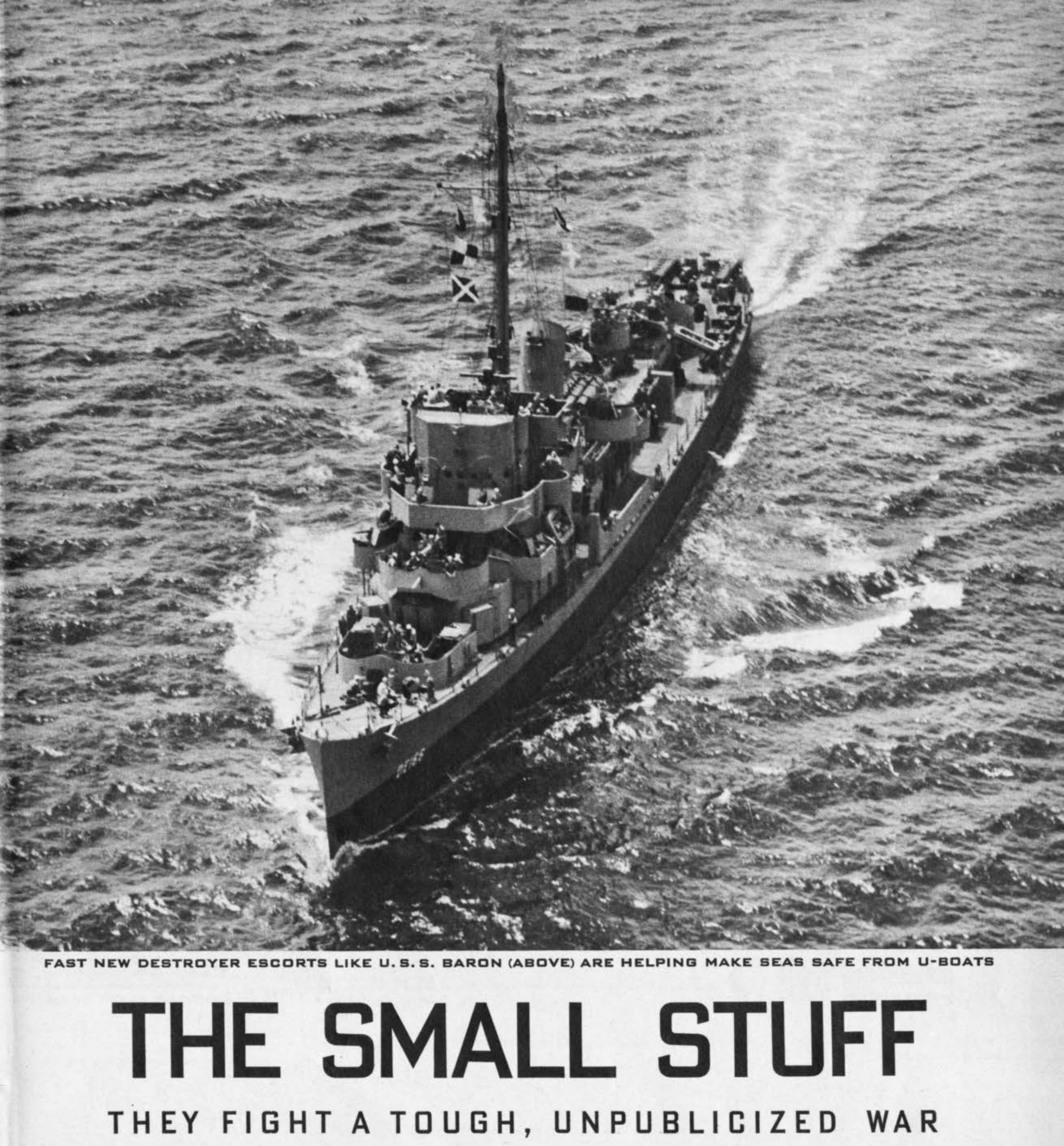

12

For answers, see p. 50



FAST NEW DESTROYER ESCORTS LIKE U. S. S. BARON (ABOVE) ARE HELPING MAKE SEAS SAFE FROM U-BOATS

# THE SMALL STUFF

## THEY FIGHT A TOUGH, UNPUBLICIZED WAR

Though the big ships get the press notices, a major naval job of this war is being done by a motley assemblage of small craft: minelayers, minesweepers, corvettes, frigates, gunboats, sub-chasers, motor torpedo boats and patrol and escort vessels of all shapes and sizes. On these ships falls the steady grind of convoying merchantmen, sweeping enemy waters and landing troops on hostile beaches, raiding enemy convoys and, perhaps toughest and most important of all, the deadly dull routine of coastal patrol. With amphibious warfare certain to increase in all theaters of war, these minor combatant types will see more action than ever before.

Since these small ships make up the great bulk of the Navy, since they are in all fields of sea action, and since the small ships of all navies look very much alike, they constitute the greatest naval recognition problem of all. The men who man our small craft are engaged in a most hazardous business. It is not for nothing that the personnel on sub-chasers, minelayers and sweepers and PT boats often refer to themselves as the suicide fleet. It is therefore particularly important that they should not be subjected to the fratricidal dangers of misrecognition. Soldiers and seamen in every activity can best protect themselves and their friends by knowing intimately the contours of the vessels on the following pages.

On the two pages immediately following, the minor warships of the U. S. are arranged in silhouette on a comparison grid, each square of which represents 50 ft. They range in size from the 453 ft. of the U.S.S. Terror, a minelayer, to the 80 ft. of the PT boat. This grid may be removed from the magazine and mounted on a bulkhead or wall. Further information about small naval craft will be found in manual Minor Combatant Craft, ONI 54-MC.

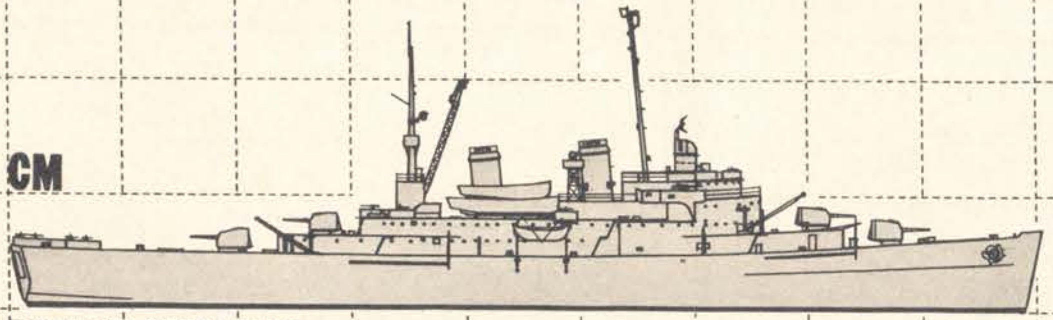
# MINOR U. S. WARSHIPS

## PRINCIPAL COMBATANT TYPES BY CLASSES

[redacted]

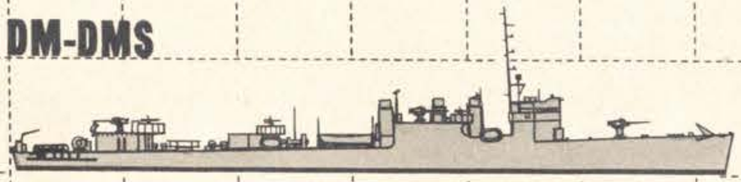
SCALE: EACH SQUARE EQUALS 50 FT.

**CM**



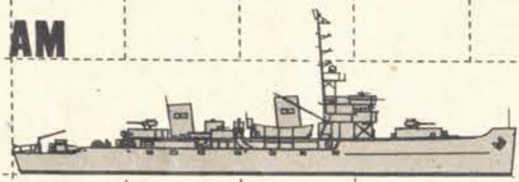
MINELAYER—TERROR CLASS

**DM-DMS**



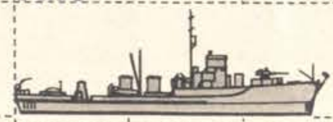
DESTROYER MINELAYER/SWEEPER—GAMBLE CLASS

**AM**



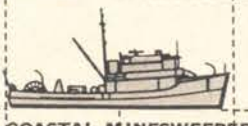
MINESWEEPER—AUK CLASS

**YMS**



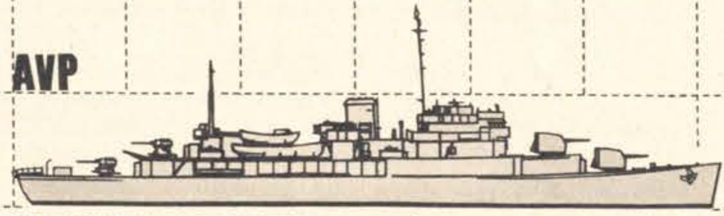
MOTOR MINESWEEPER—136-FT. CLASS

**AMc**



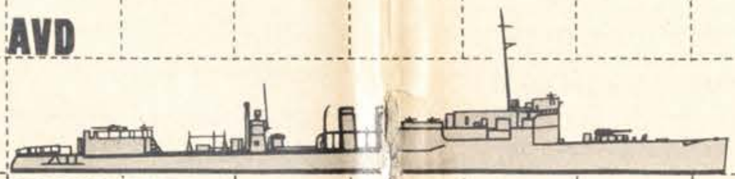
COASTAL MINESWEEPER (APc similar)

**AVP**



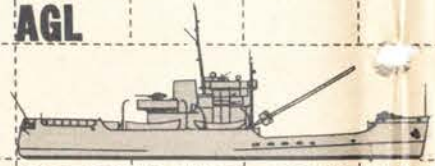
SEAPLANE TENDER—BARNEGAT CLASS (AGP similar)

**AVD**



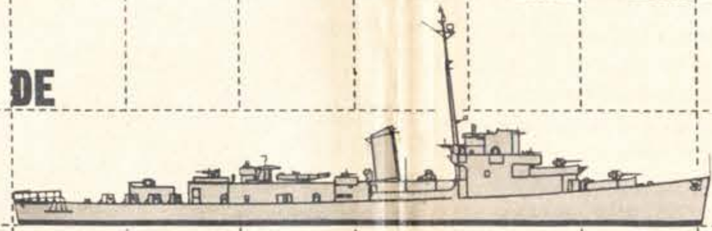
SEAPLANE TENDER—CHILDS, MANLEY CLASSES (APD similar)

**AGL**

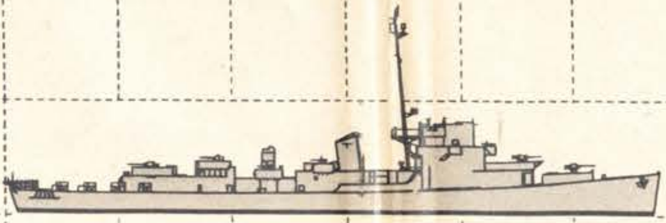


COAST GUARD TENDER—CACTUS CLASS

**DE**

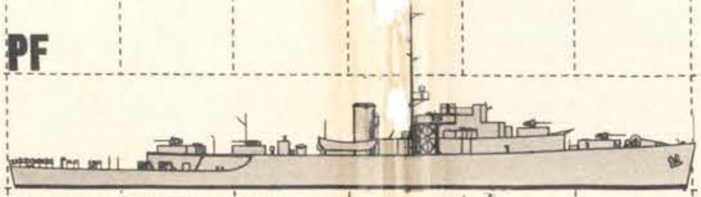


DESTROYER ESCORT (LONG HULL)—BUCKLEY CLASS



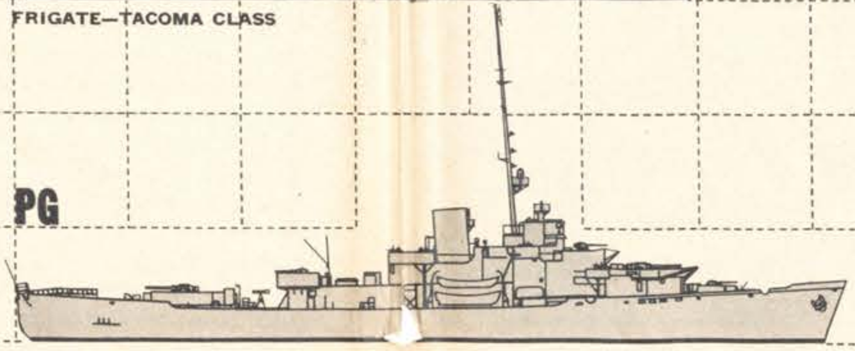
DESTROYER ESCORT (SHORT HULL)—EVARTS CLASS

**PF**

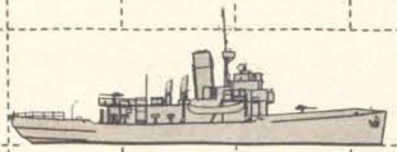


FRIGATE—TACOMA CLASS

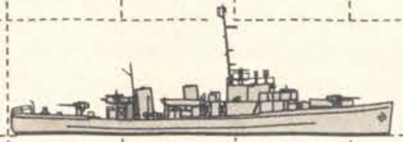
**PG**



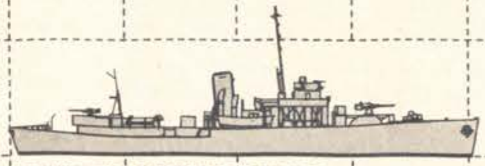
COAST GUARD CUTTER—CAMPBELL CLASS



COAST GUARD CUTTER—"A" CLASS

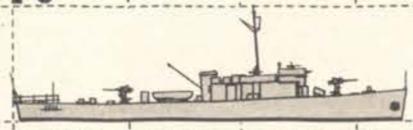


COAST GUARD CUTTER—"B" CLASS



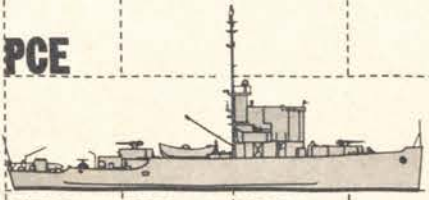
CORVETTE—TEMPTRESS CLASS

**PC**



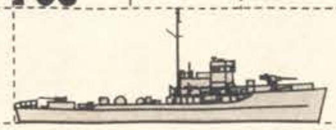
SUBMARINE CHASER—PC 461 CLASS

**PCE**



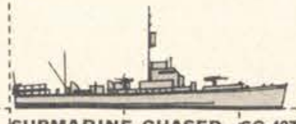
PATROL ESCORT—PCE 827 CLASS

**PCS**



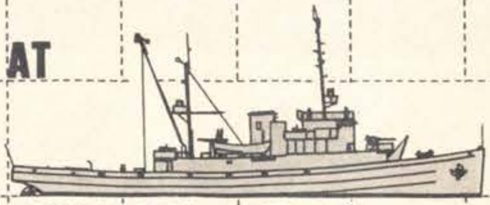
SUBMARINE CHASER—PCS 1376 CLASS

**SC**

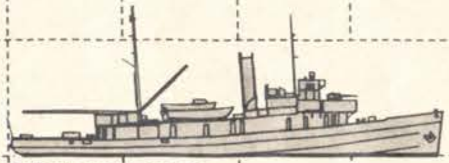


SUBMARINE CHASER—SC 497 CLASS

**AT**

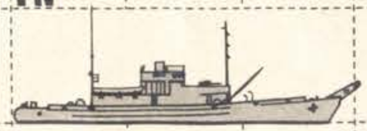


OCEANGOING TUG—NAVAJO CLASS



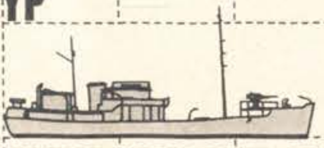
OLD "BIRD" CLASS

**YN**



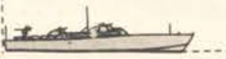
NET TENDER—"TREE" CLASS

**YP**



DISTRICT PATROL CRAFT—CONVERTED TRAWLERS

**PT**



MOTOR TORPEDO BOAT—PT 103 CLASS

DIVISION OF NAVAL INTELLIGENCE—IDENTIFICATION AND CHARACTERISTICS SECTION—DECEMBER 1943

# SUBMARINE STALKERS

## CLEAR SEA LANES FOR OUR CONVOYS

In sub-chasing, the number of ships available is a lot more important than their armament and size. When only a few escort vessels were available to accompany a convoy, they had to stick to their slower, clumsy charges, screen them from marauders. But now that spare sub-chasers are at hand, they can detach themselves without weakening the convoy's defense, can chase individual U-boats, spotted either by the detecting devices they carry or by carrier and land-based airplanes, and pound away until their quarry is sunk.

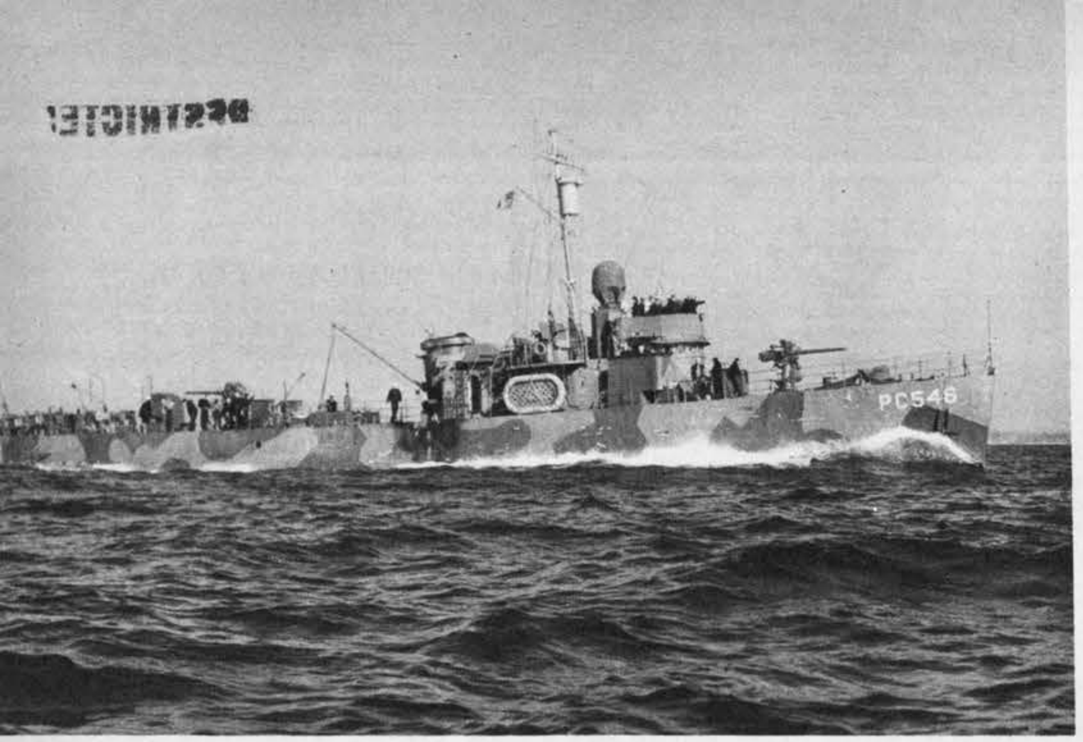
Three types of the small, easy-to-build anti-submarine vessels of the U. S. Navy are shown on these pages. They are classified as PC's, PCE's and SC's, but these classifications are not so rigid as those of the major types, are used chiefly to describe the vessel. For one thing, PC's may operate either as patrol craft or submarine chasers. For another, some PC and PCE units have been converted to AM's. Remembering this is essential, for an observer may make the fatal error of deciding that a PC cannot be a PC simply because there is no tactical need for sub-chasing in his area.

Though frail-looking, PC's are capable of getting in and mixing it with submarines. Their skippers are perfectly willing to ram subs in order to complete the kill. By attacking submarines, even when they fail to sink them, the small escort boats are doing an extremely valuable job. When a U-boat dives several hundred feet, it has a very good chance of escaping destruction, but it is certainly in no position to threaten any merchantmen. The small sub-hunting craft, the terriers of the fleet, help keep the sea lanes open for the successful passage of men and weapons to the fighting fronts.

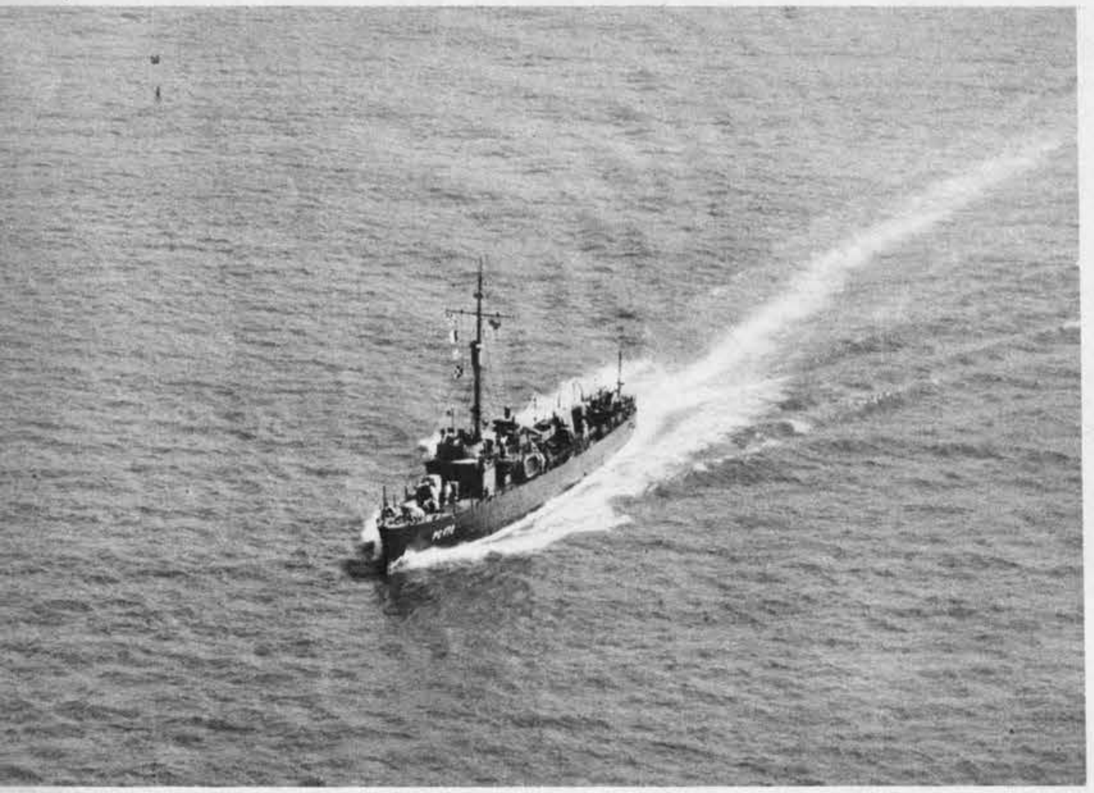
**RECOGNITION:** The PC is a 173-ft. steel flushdecker. Its short capped stack is close up against the superstructure. The bridge looks enough like a sub's conning tower to cause confusion at long range. Deck guns are mounted both fore and aft, while depth bomb racks are ready for action at the ship's stern.

PCE's have high freeboard forward, broken two-thirds of the way aft. Longer than PC's, they have no stack. Superstructure is taller and more pronounced than on a PC.

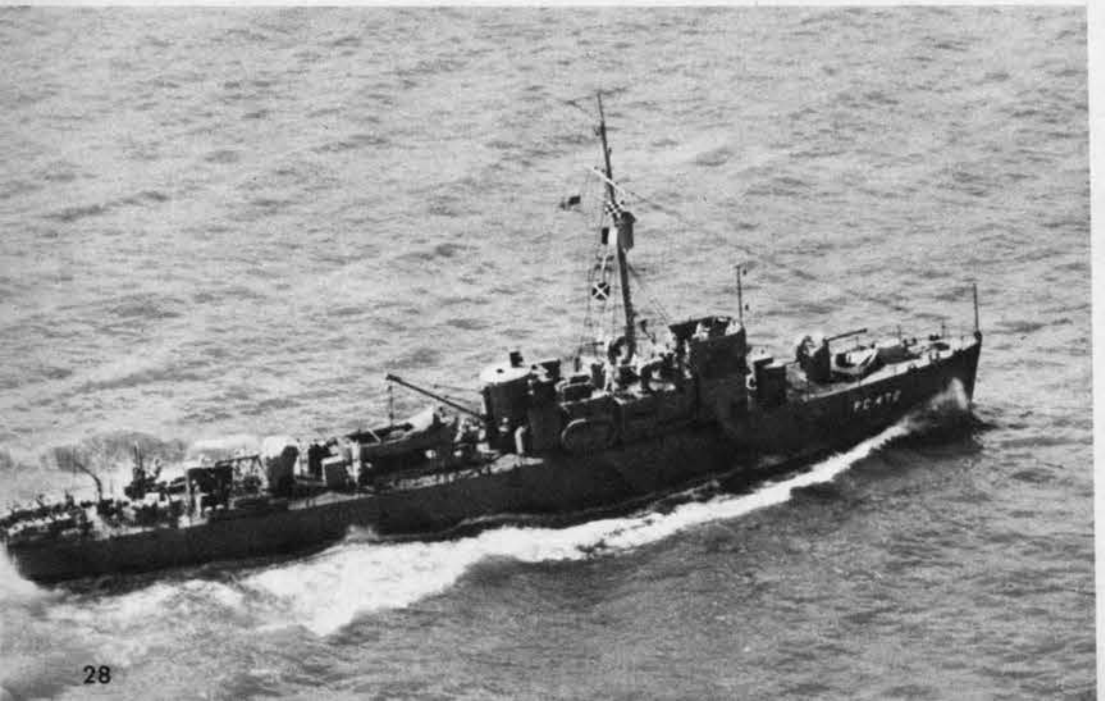
Like the PC, the SC is frequently mistaken for a submarine. It is a 110-ft. flushdecker with a pole mast, deck gun forward.

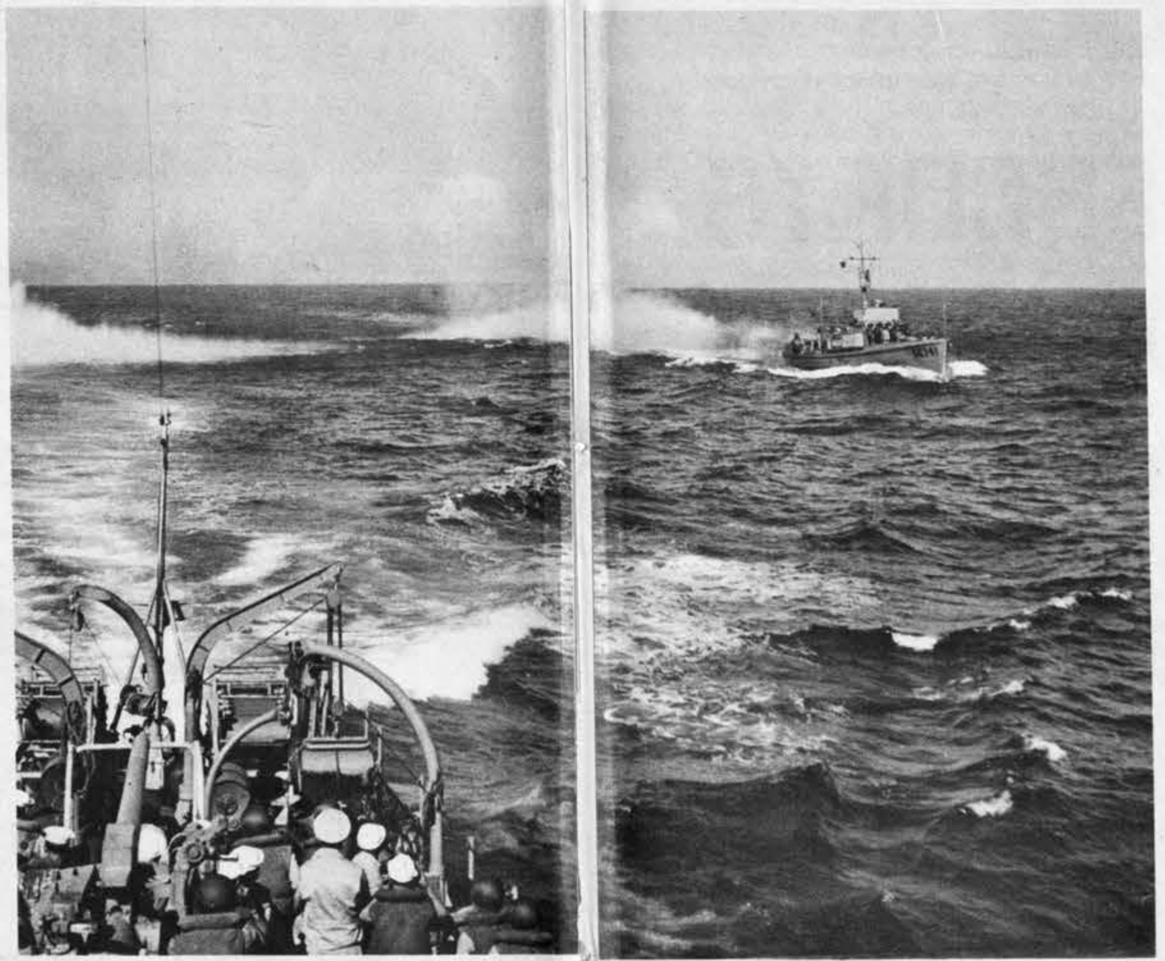


**PC IS 173-FT.** steel sub-chaser. Side view emphasizes pole mainmast and single island from stack to bridge set forward. Flush deck, guns, raked bow may also be observed from this angle.

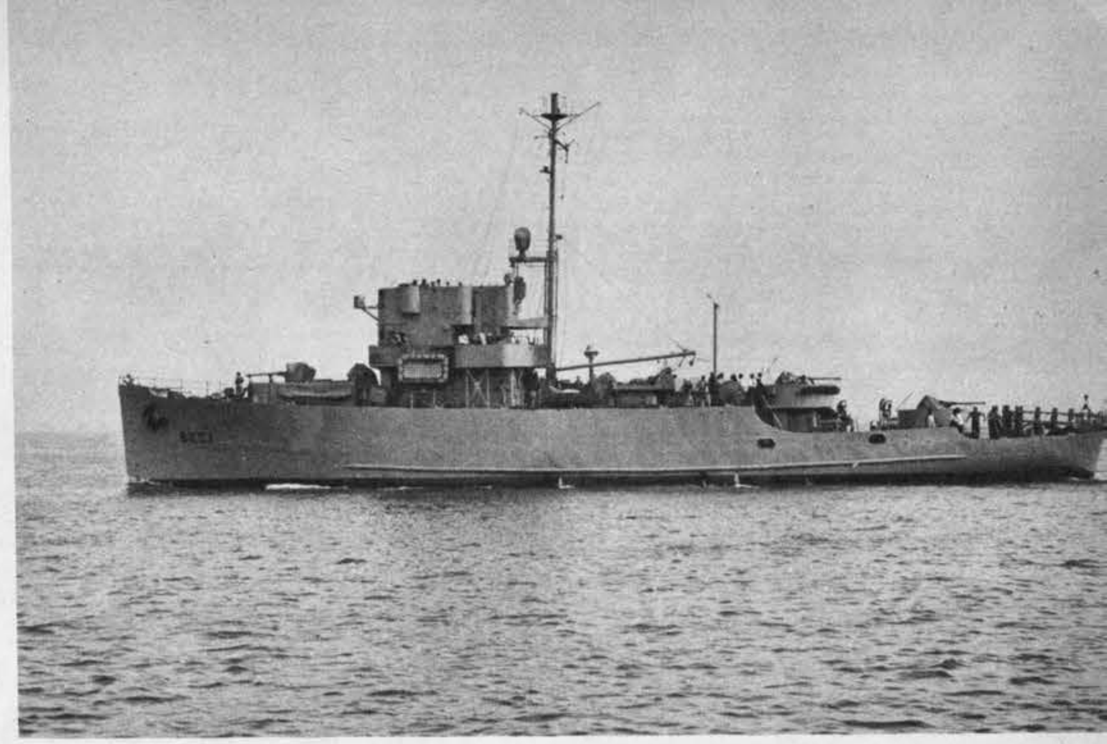


**TALL MAST OF PC,** shown above and below, stands out in aerial view. Unusually low funnel is nearly buried against deckhouse forward, giving the craft the appearance of a cabin cruiser.

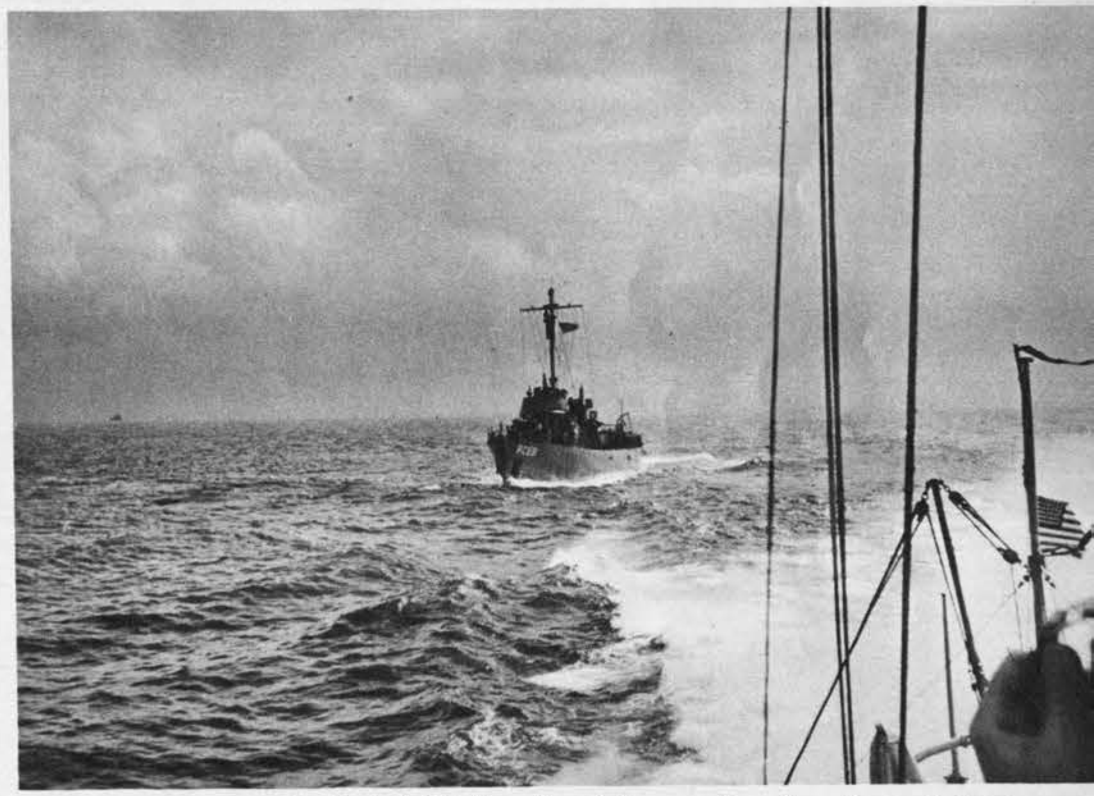




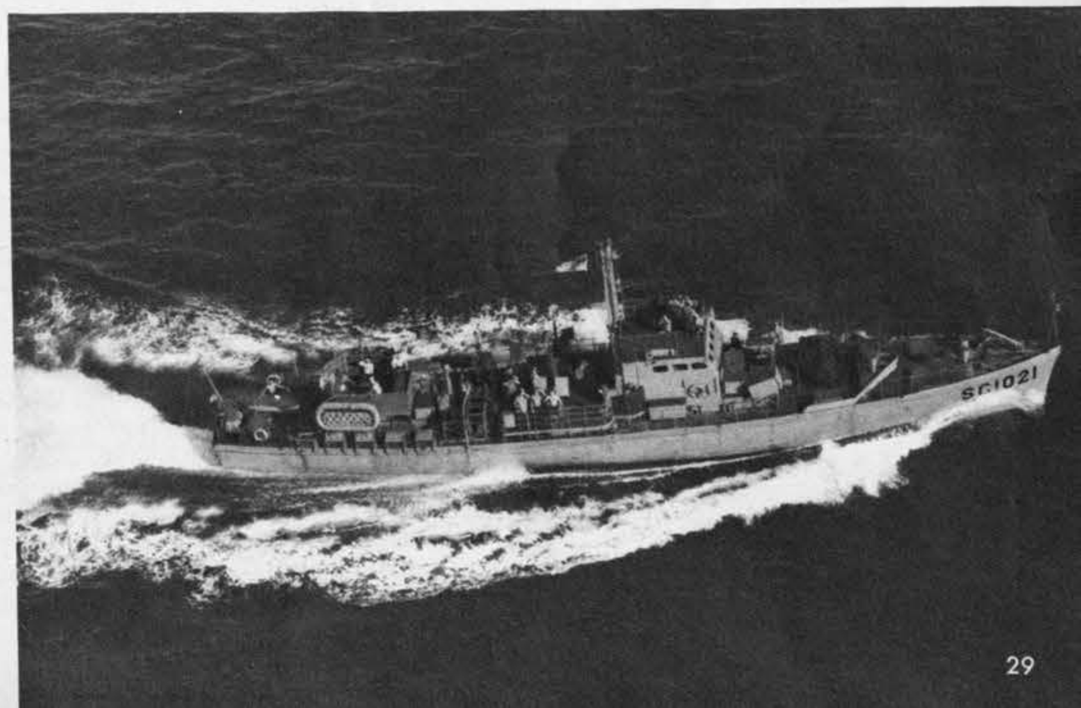
**SC IS SHORTER** than boats of PC class, has no stack. Wooden 100-foot vessel has one deck gun forward and depth charges at stern. From this angle it shows a resemblance to the PC's.

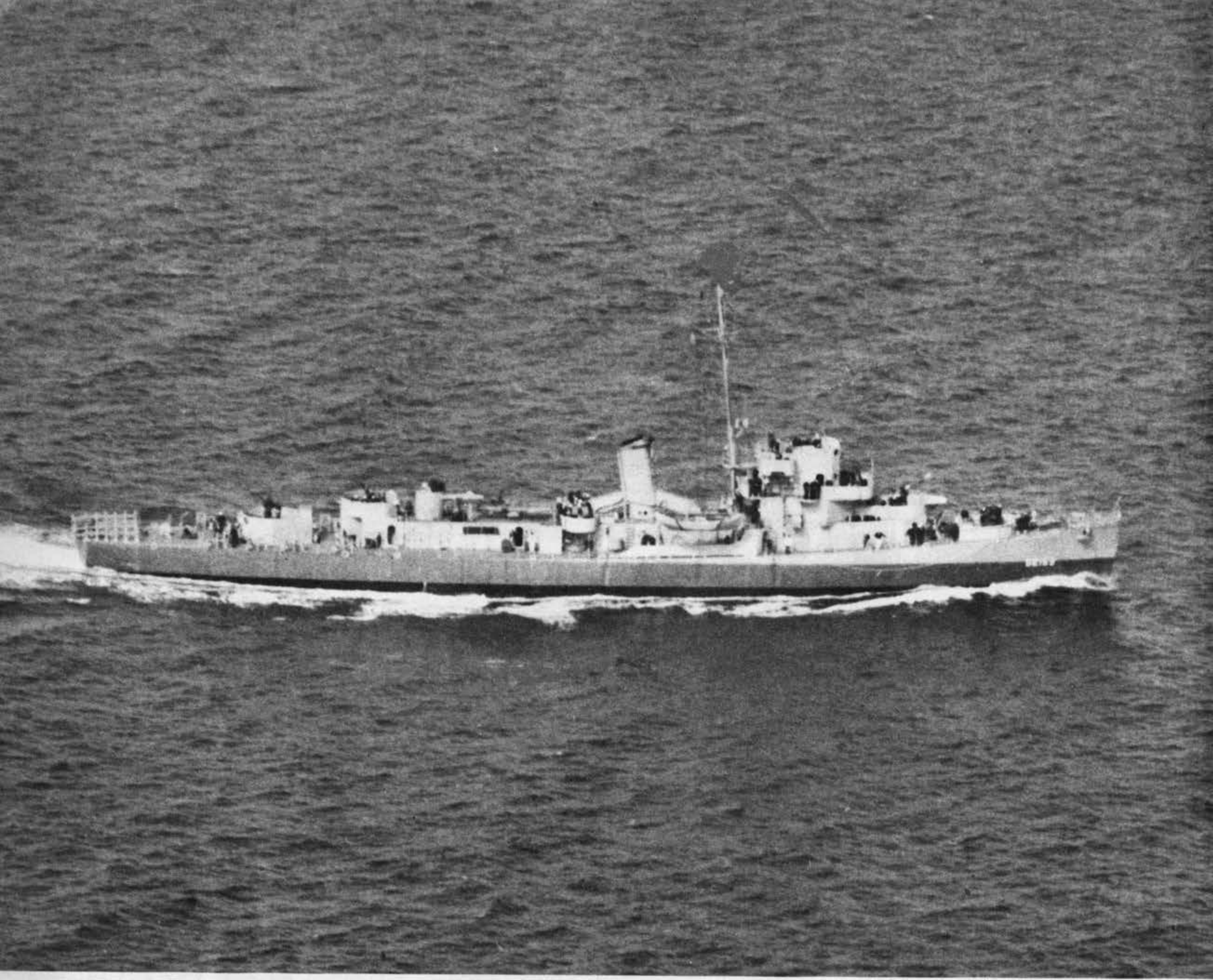


**LONGER AND TALLER** than PC, PCE is designed for a great variety of uses. Note high freeboard forward breaking down to low stern. Bridge looks like fort forward of tall pole mast.



**PC HAS TALL MAST,** low flush-deck hull. Both PC and SC (*below*) have been mistaken for subs because of low silhouette, conning tower-like bridge, resemblance of wake to that of sub.





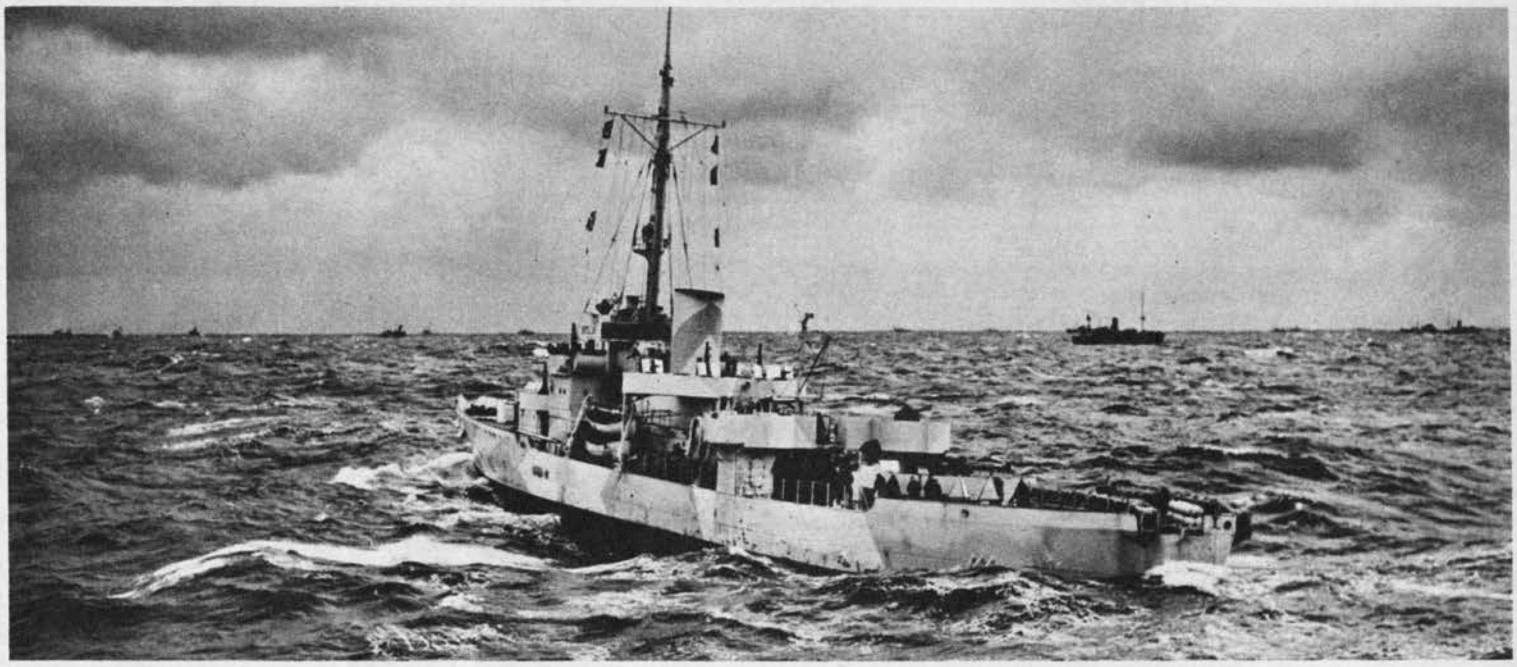
**DESTROYER ESCORT REUBEN JAMES HAS NARROW LINES OF DESTROYER BUT SIMPLER SUPERSTRUCTURE**

# NEW ESCORTS REPLACE DD'S

## GUARD CARGO SHIPS

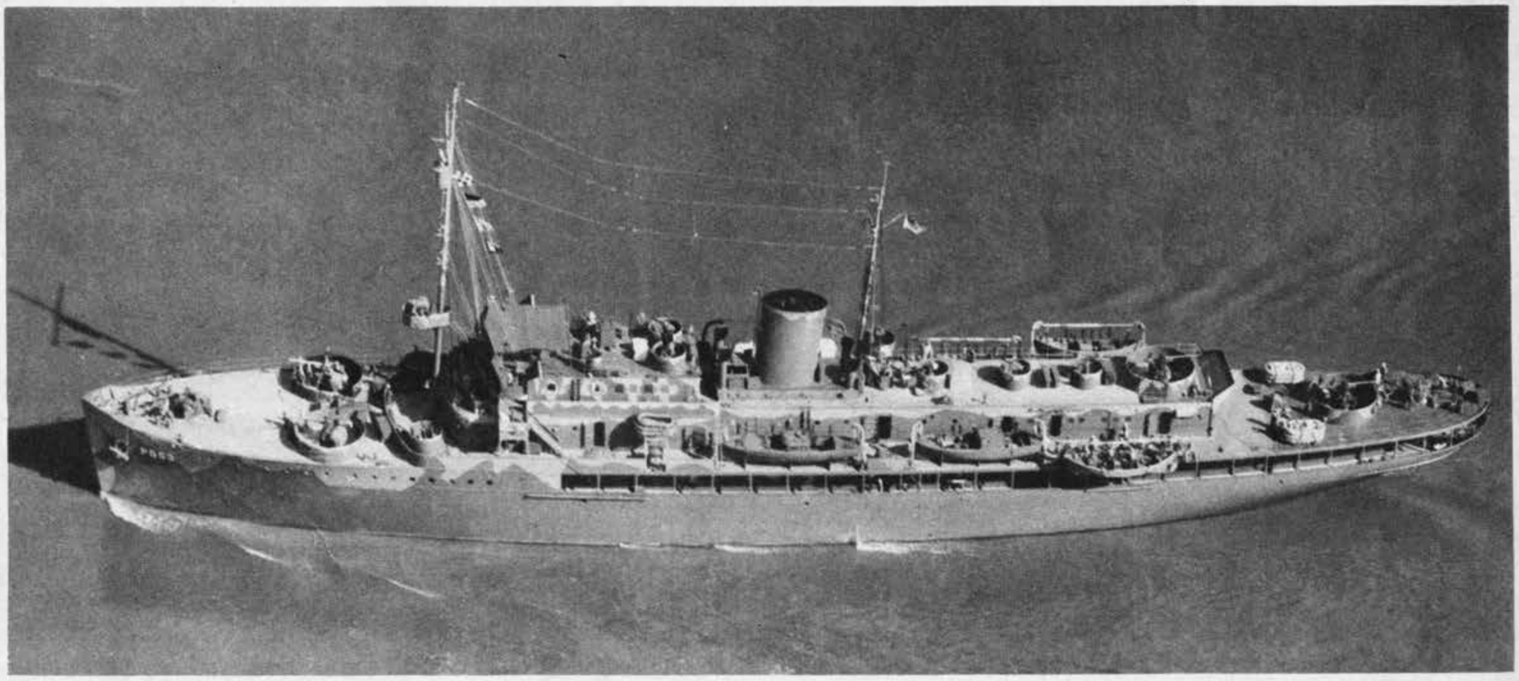
The new destroyer escorts and large Coast Guard cutters have made the protection of Allied convoys a much surer, simpler business. They have relieved faster and more heavily armed destroyers for fleet action. The steel-hulled DE's are made in two versions: long hull and short hull. They also differ slightly in armament; the short hull DE does not mount torpedo tubes. Cutters and gunboats, the PG's, range in size from the Spencer Class, slightly larger than a DE, to A and B Class cutters of half this size.

**RECOGNITION:** Both DE's somewhat resemble U. S. destroyers, are chiefly distinguished by their simplified superstructure and by the absence of full gun shields on the main batteries. The long hull DE has a bank of torpedo tubes abaft the stack. Large PG's have a much broader beam and higher and heavier superstructure than the DE's. A-Class cutters have one tall stack while B-Class ships have two squat stacks.

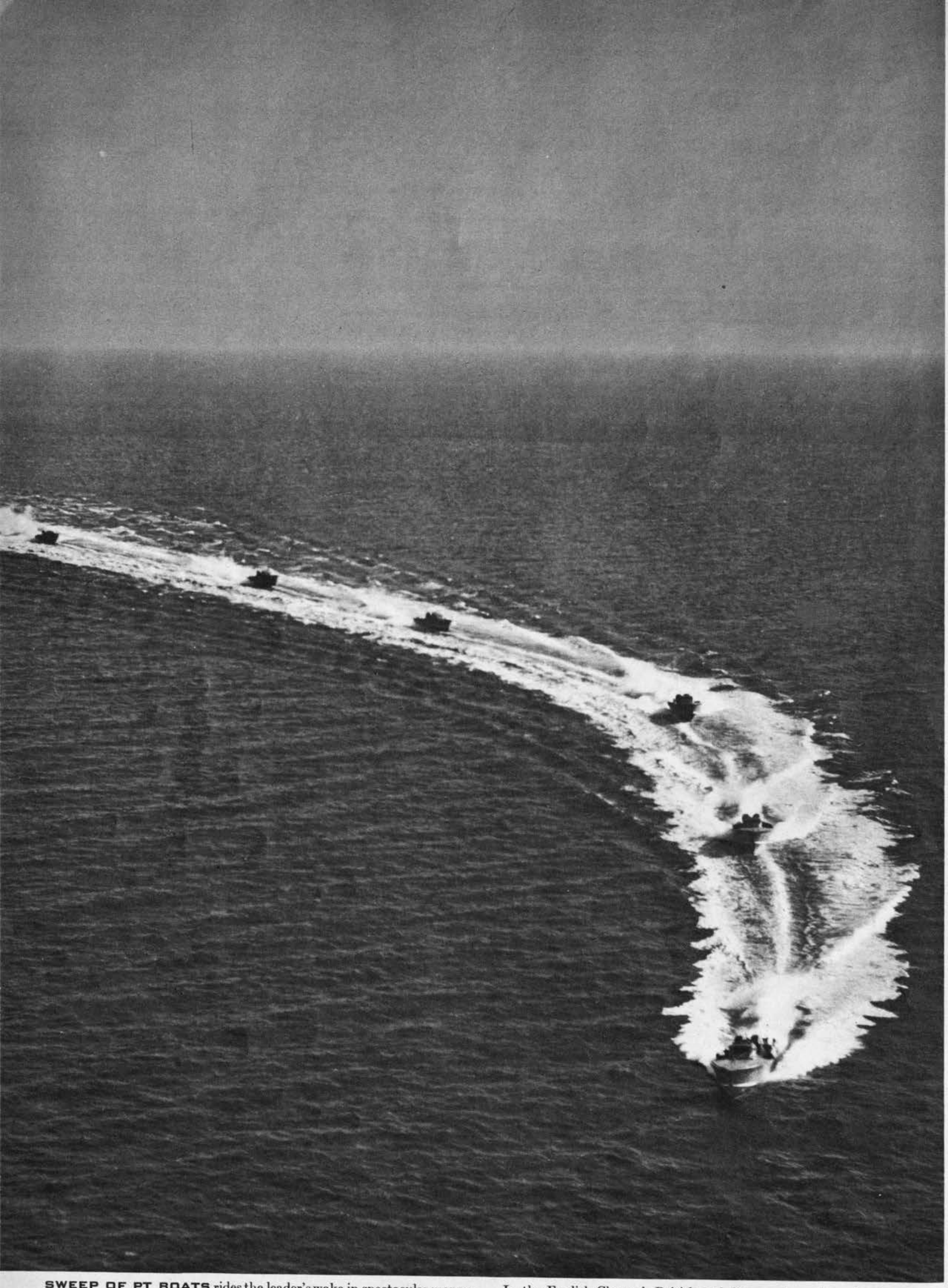


**CAMPBELL CLASS CUTTER** on convoy duty receives line for the transfer of messages from squadron leader. Notice raised gun platforms aft of superstructure and raised gunwales aft. Class carries heavy guns to battle any U-boat but main weapons are depth charges seen on stern.

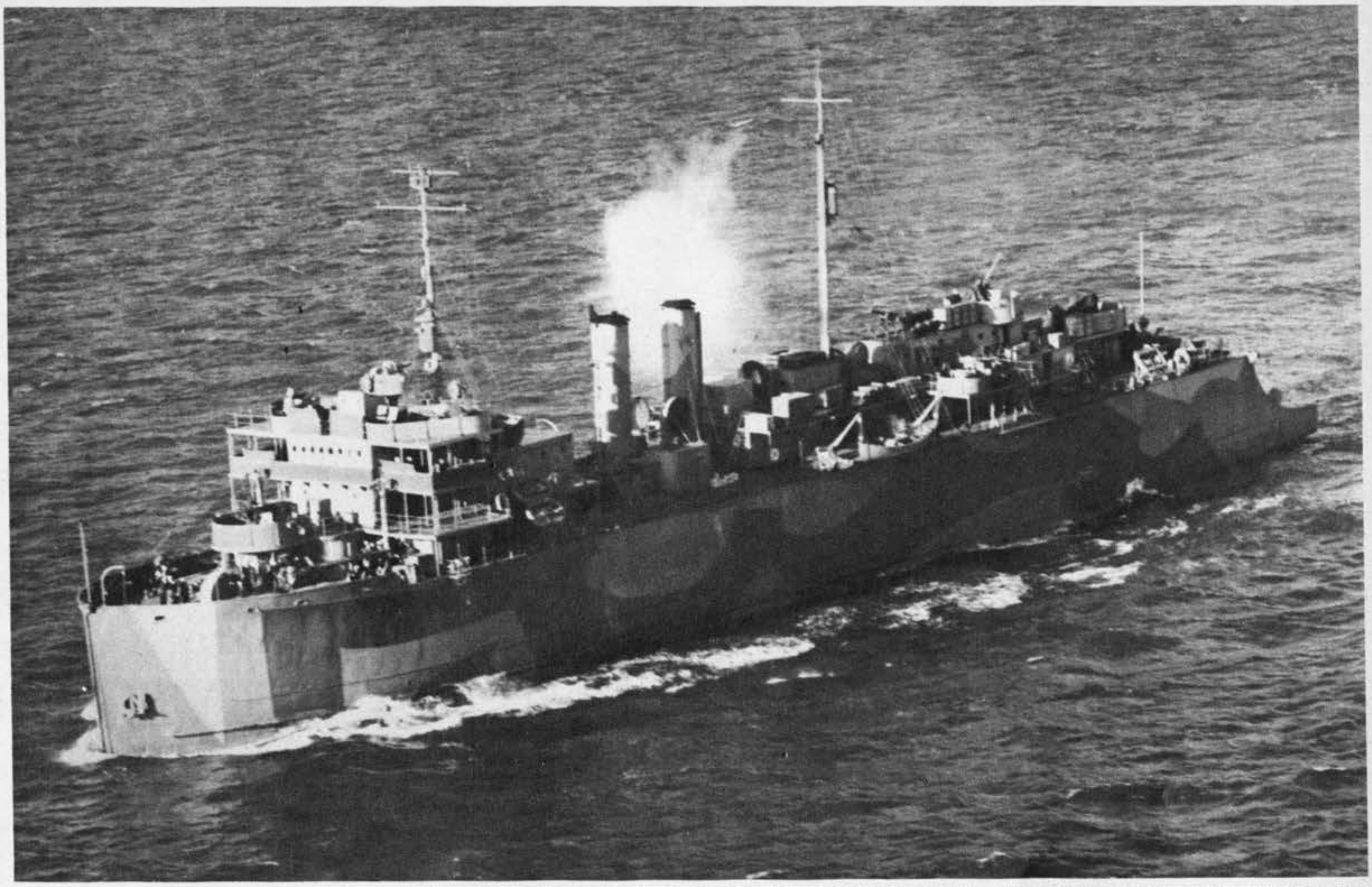
**U.S.C.G. SPENCER** has at least one U-boat to her credit, having depth-bombed and outgunned a German submarine while engaged in convoy duty in Atlantic. In this view, several of her very effective guns are seen. Numerous AA and dual-purpose guns protect her from attack.



**U.S.S. VIXEN** is the former pleasure yacht Orion, converted to wartime duties. Many such conversions were made in the early rush of war preparation before naval building program was in full swing. They retain original appearance plus some deck guns and depth-charge gear.



**SWEEP OF PT BOATS** rides the leader's wake in spectacular maneuver. These small craft, often referred to as mosquito boats, have engaged in the most daring of naval actions against overpowering enemy odds. In the English Channel, British and German types have kept up a constant guerrilla warfare since Sept., 1939. Too small to identify by detail, PT's are best spotted by their tremendous foaming wakes and broad decks.

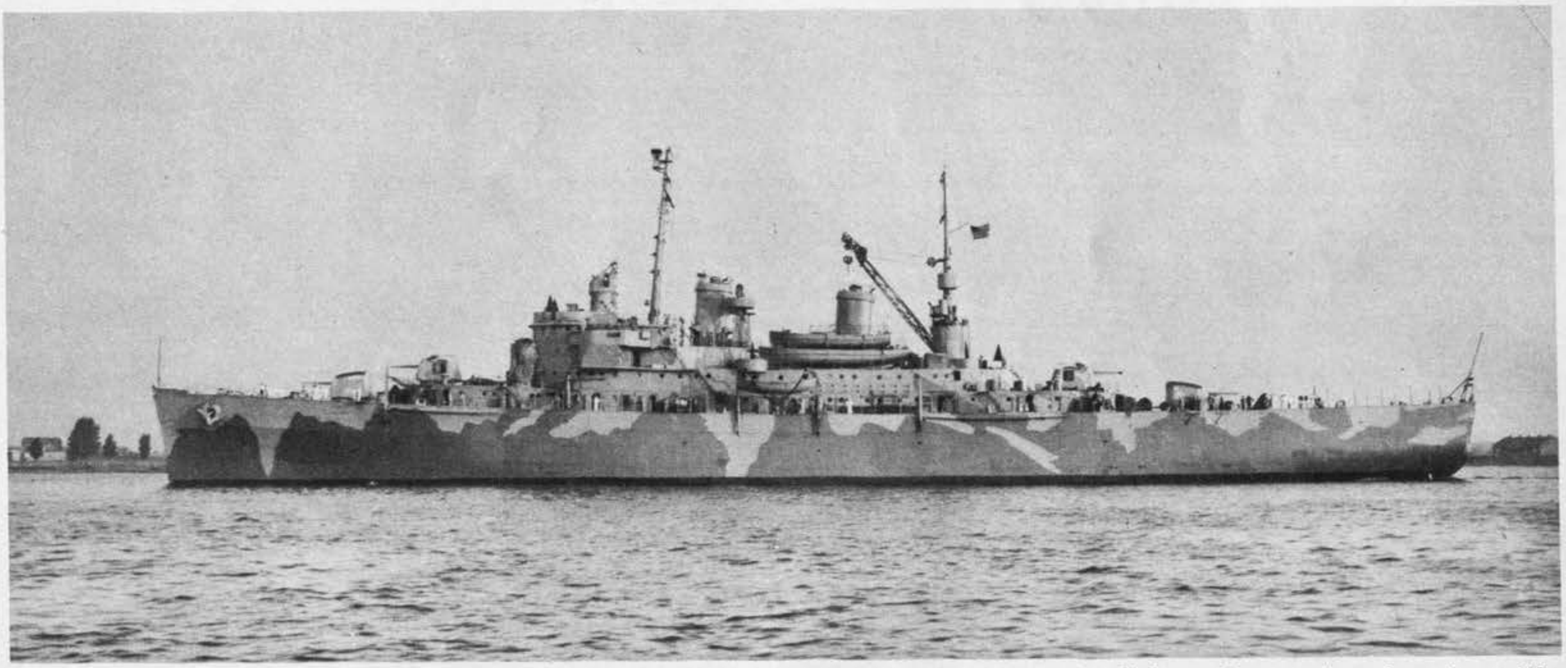


**MINELAYER, WEEHAWKEN, HAS HIGH DECK CUT AWAY AFT FOR DROPPING MINES AND CLOSELY-SPACED STACKS**

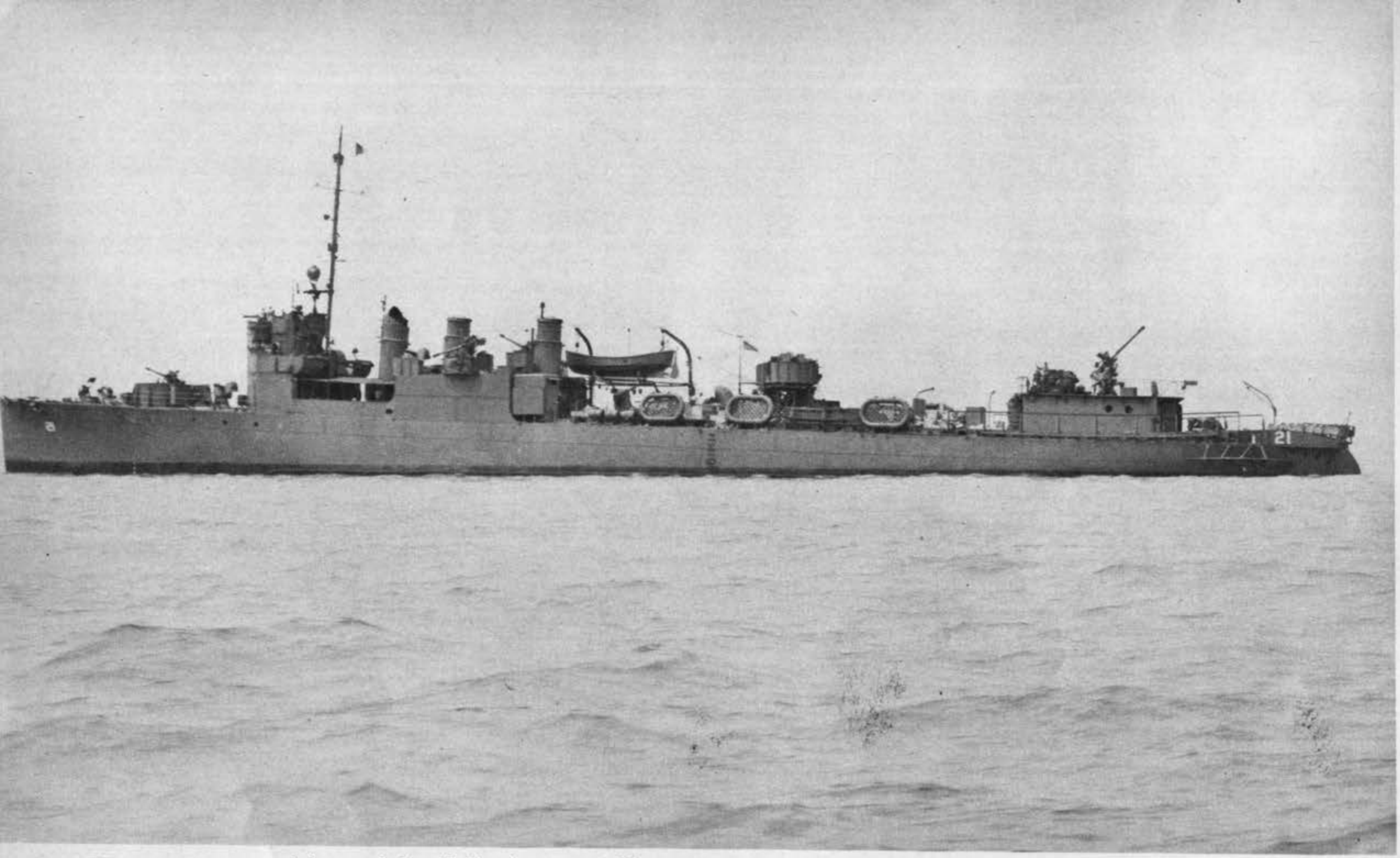
# BIG & LITTLE

## MINOR COMBATANT TYPES RUN FROM HUGE CM'S TO TINY PT'S

Biggest minelayer of the U. S. Fleet is the new U. S. S. Terror; smallest active warship type is the PT boat, the Navy's fastest craft. Between these extremes fall the other classes illustrated on these pages. The bulk of our minelaying falls on the big CM's which carry large stores of mines to distant areas, plant extensive fields. Some are new, designed-for-the-job ships like the U. S. S. Terror (*below*); others are converted train ferries or ex-merchantmen. Newcomers in this war, the PT boats are high-powered, high-speed craft equipped with either two or four torpedo tubes. In action they cast a very large bow wave and wake which helps to identify them at a distance or from the air (see *Journal*, October issue).



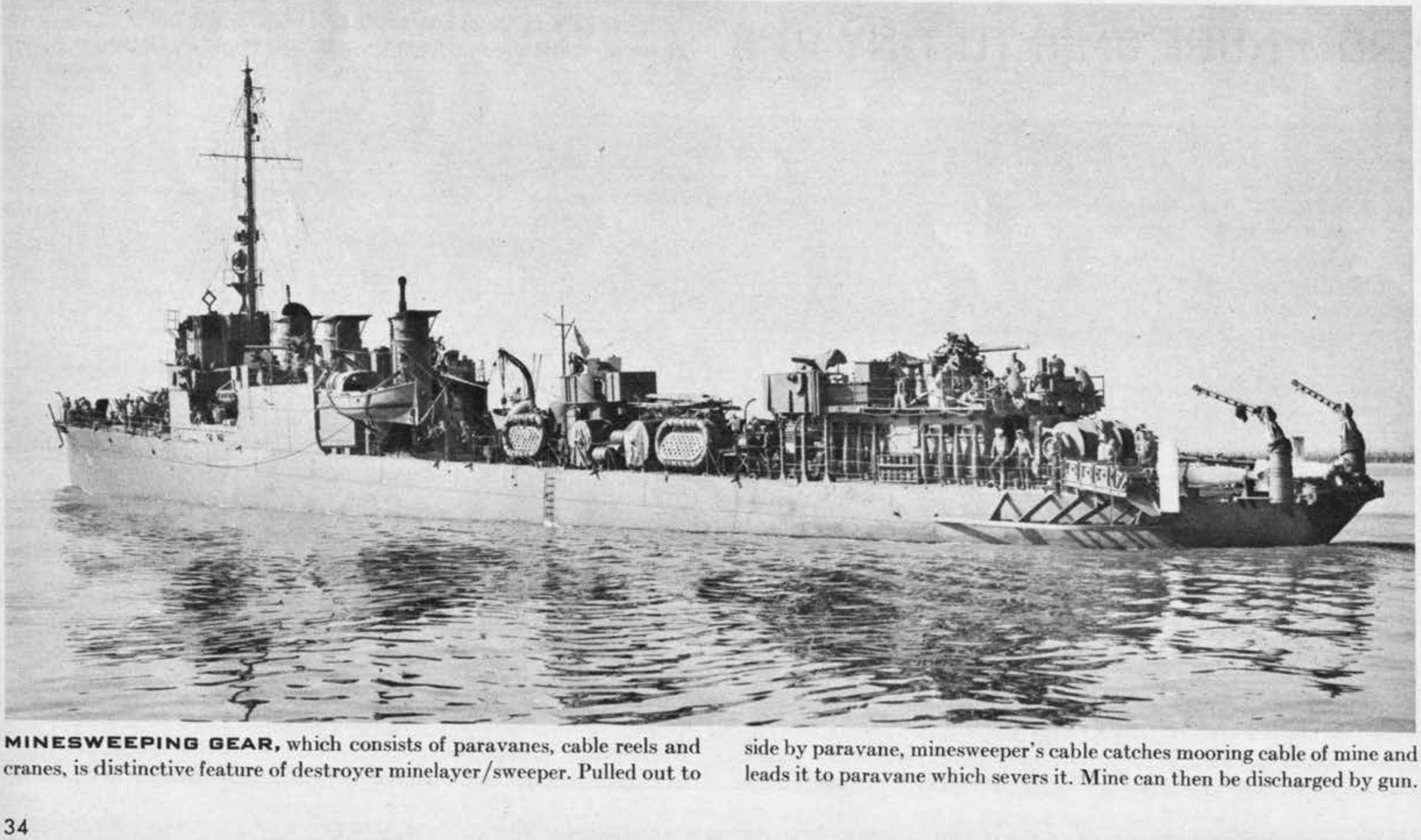
**NEWEST, BIGGEST MINELAYER** is the U. S. S. Terror, a finely designed, modern-looking ship. Two short capped stacks rise from a massive island superstructure. Foremast is a heavy pole between fire director and forward stack; mainmast is a lighter pole supporting a large boom. The Terror carries its main battery in four turrets—two forward and two aft. Her superstructure has the same clean lines as our Iowa Class battleships.



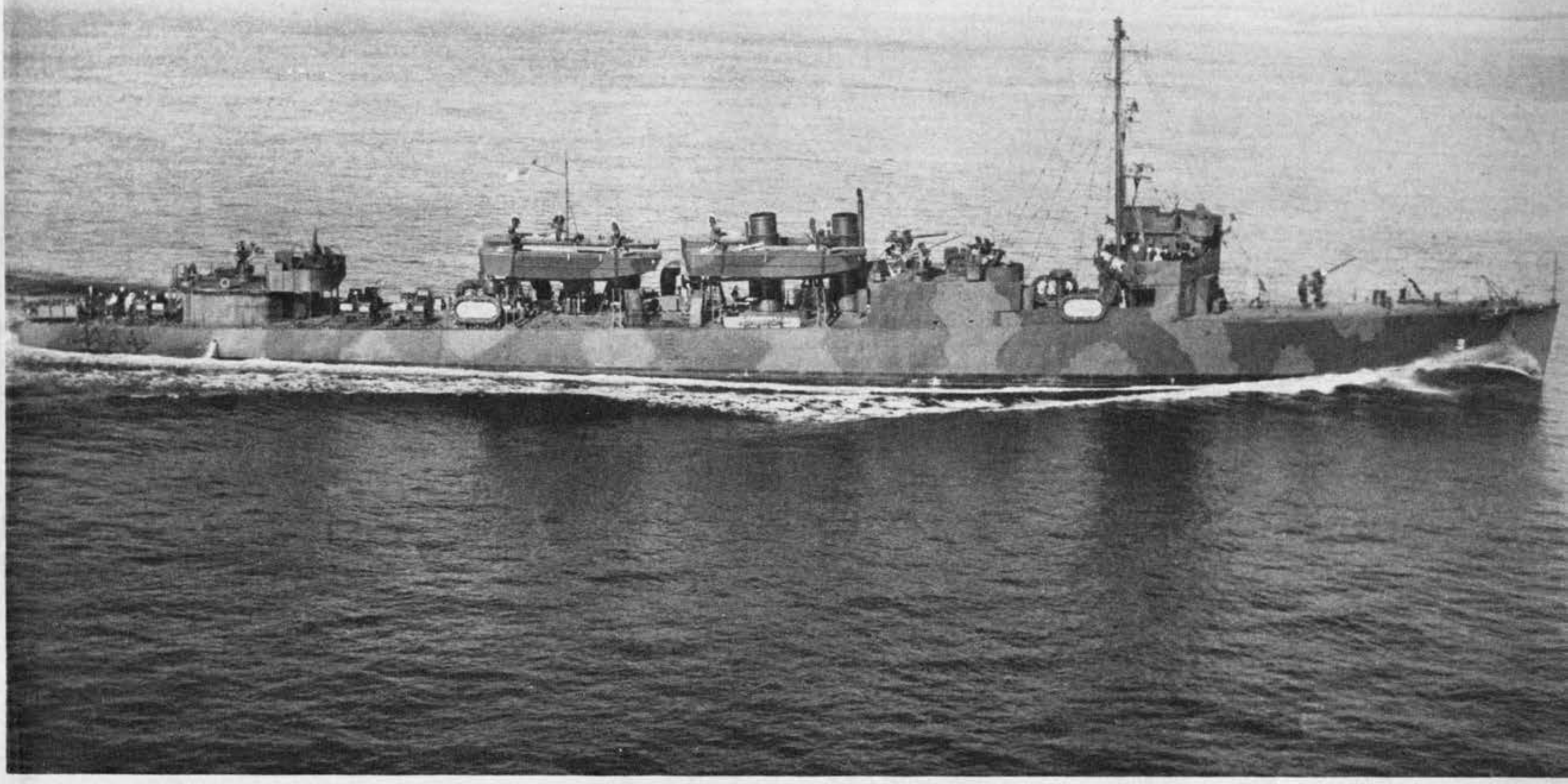
**FLEET MINELAYING** is frequently handled by the converted destroyers classified as DM's. In a large naval battle, these craft might sweep across the path of the enemy fleet, sow deadly floating mines in line of advance. Except for mineracks and amidships structure, they resemble old DD's.

# NEW LIFE FOR FLUSHDECKERS

In the new guise of minelayer, minesweeper, seaplane tender or high-speed transport, many World War I flushdeck destroyers are back at sea. Sisterships of lend-leased destroyers (many of which underwent similar conversions in Britain), these older "cans" have taken on many auxiliary jobs where the destroyer's speed and offensive and defensive power will pay off. Minesweeping versions often move in before all other attack forces to clear the waters so our landing barges can carry the invaders safely to the



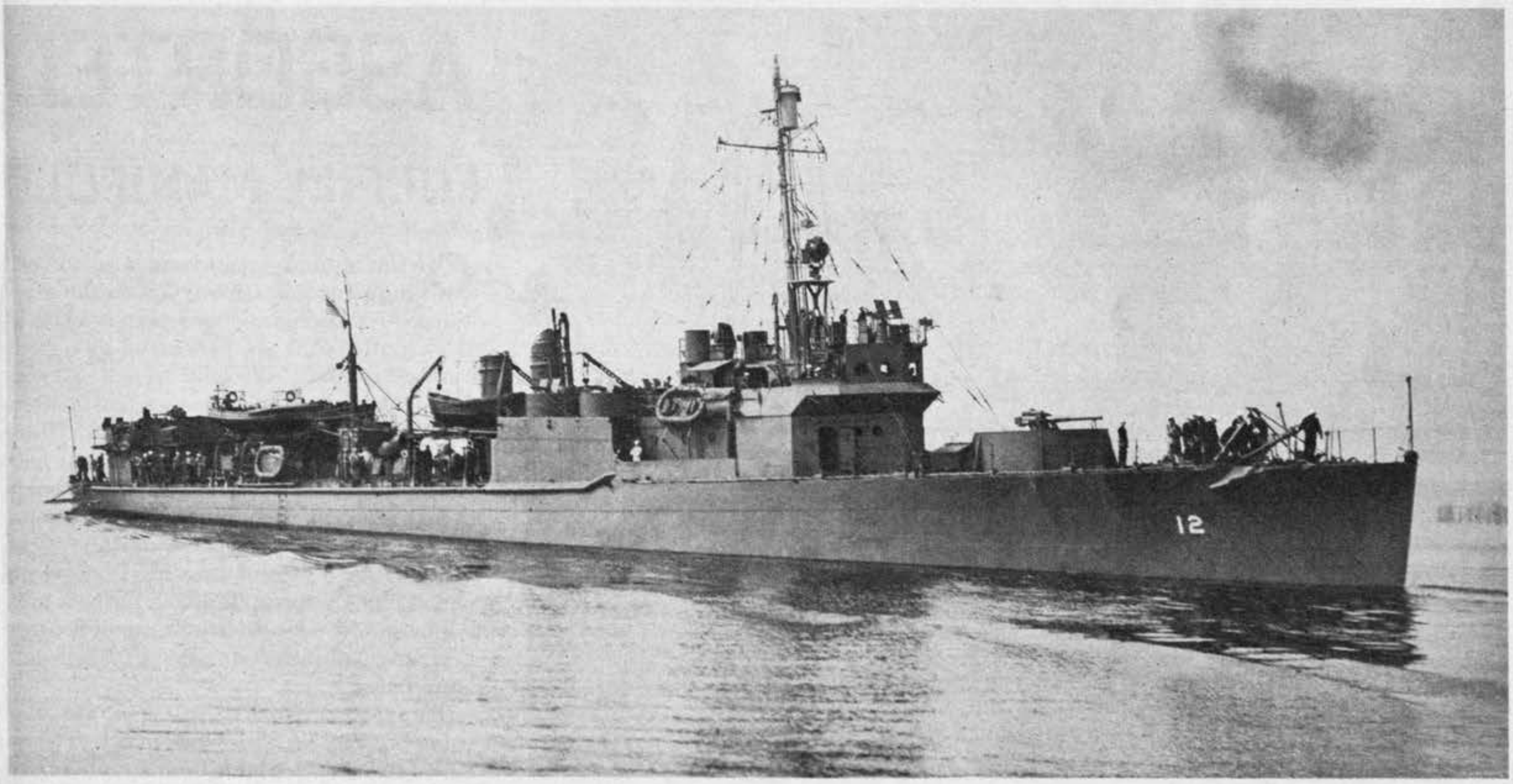
**MINESWEEPING GEAR,** which consists of paravanes, cable reels and cranes, is distinctive feature of destroyer minelayer/sweeper. Pulled out to side by paravane, minesweeper's cable catches mooring cable of mine and leads it to paravane which severs it. Mine can then be discharged by gun.



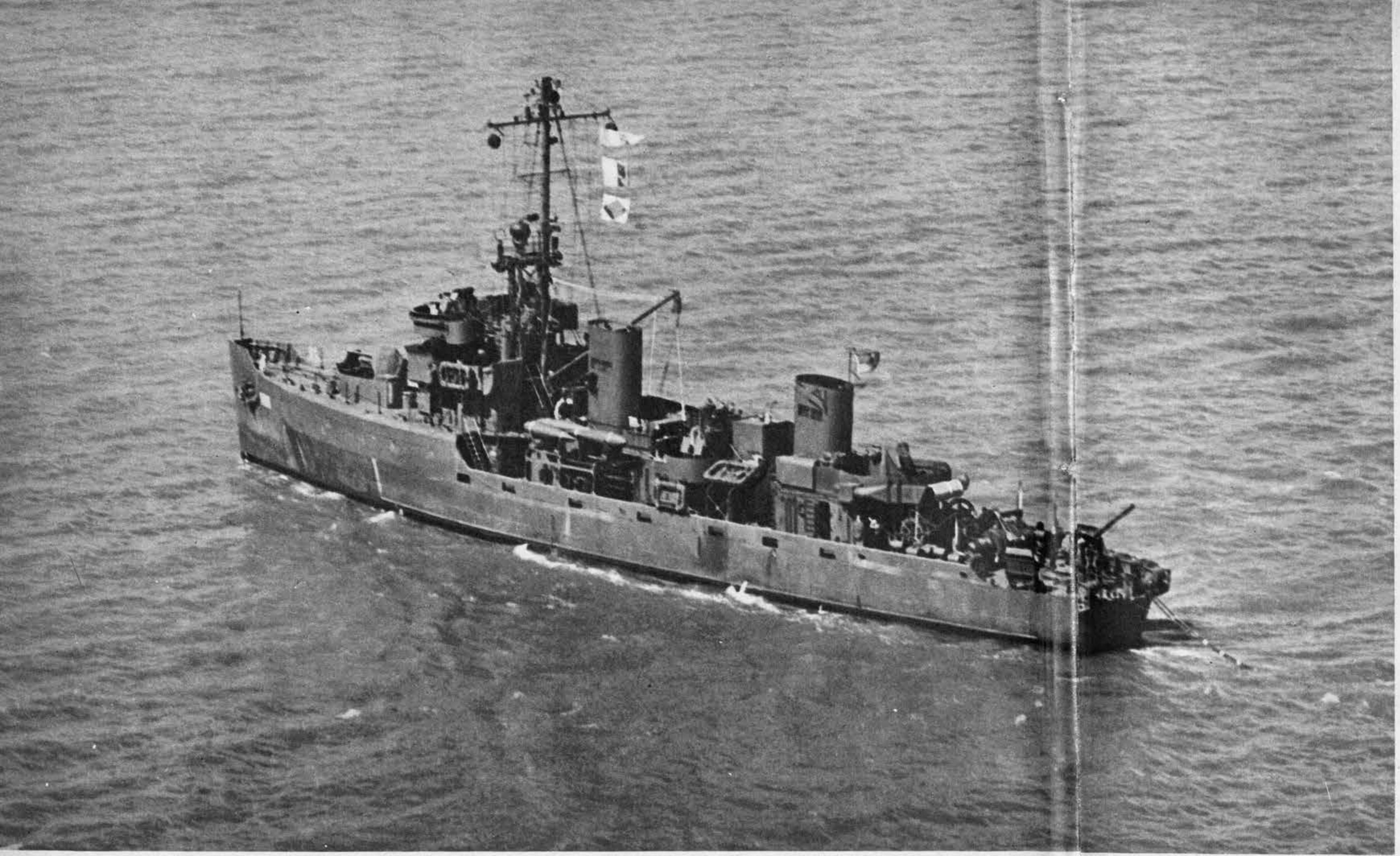
**HIGH-SPEED TRANSPORT** carries four assault boats amidships, ferries troops for short hauls on raids into enemy territory. Like the AVD's (*below*) APD's have only two stacks. Armament includes standard deck guns, additional AA and depth charge gear but ship has no torpedo tubes.

beach. As high-speed transports (APD's) they carry picked troops on dangerous forays. Swift seaplane tenders ply the hazardous waters of the Southwest Pacific to keep our aerial scouts on the job.

**RECOGNITION:** The conversions maintain the distinctive lines of the old destroyer type with its long, low hull and flush deck. The bridge structure is well forward and rather small. The stacks—which in these conversions may number from two to four—are just forward of amidships. The unshielded stern gun is mounted on a deckhouse aft. In the DM and DMS types—the minelayer sweepers—the ship is often distinguished by the sweeping gear, mining gear amidships, and lack of torpedo tubes. The APD's, or high-speed transports, are distinguished by the heavy assault boats slung from davits port and starboard. Destroyer seaplane tenders (AVD's) have plane-handling gear. Also one set of boilers has been removed from the AVD's, so only two stacks are necessary, and the bridge superstructure has been extended across the well.



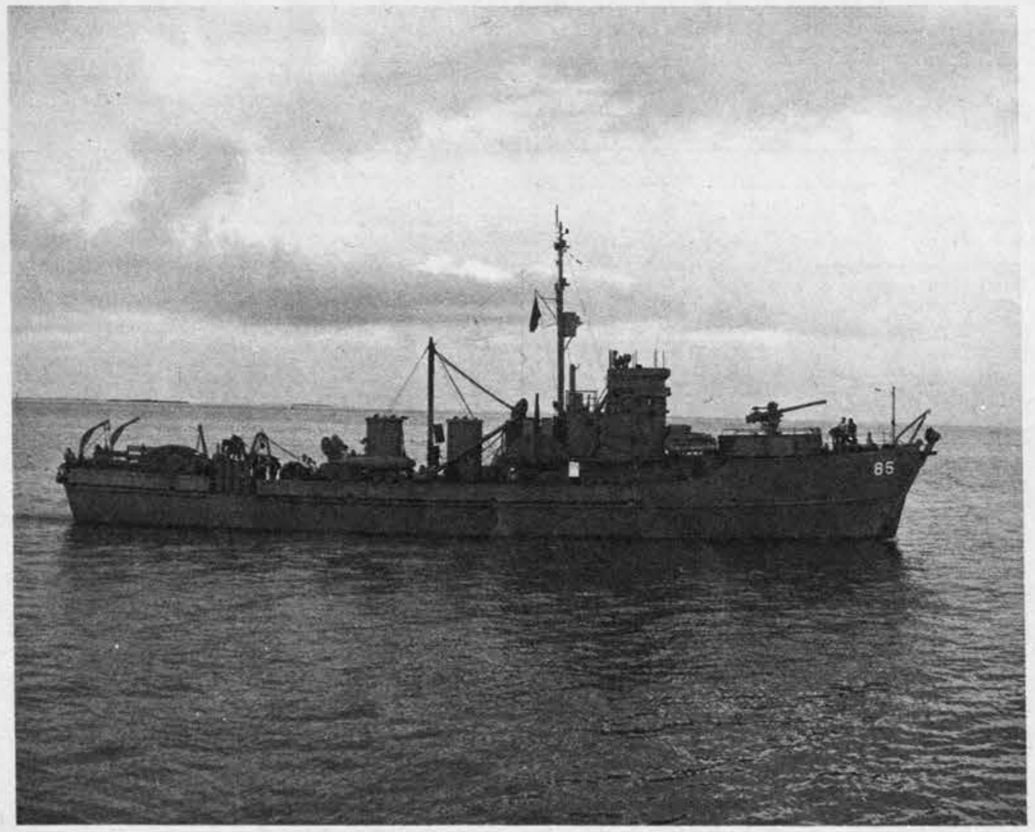
**FAST SEAPLANE TENDER** is formed from World War I flushdecker. Classed as AVD's, they increase the tactical mobility of our scout planes by providing them with a home at sea. To supply increased cargo space one set of boilers has been removed, necessitating only two visible stacks.



**LOOKING LIKE A CROSS BETWEEN A DESTROYER AND A TUGBOAT, THE U.S.S. HERALD IS A STURDY, FAST MINESWEEPER FOR GENERAL SERVICE**

# ASSORTED VESSELS

## FULFILL MANIFOLD DUTIES FOR NAVY

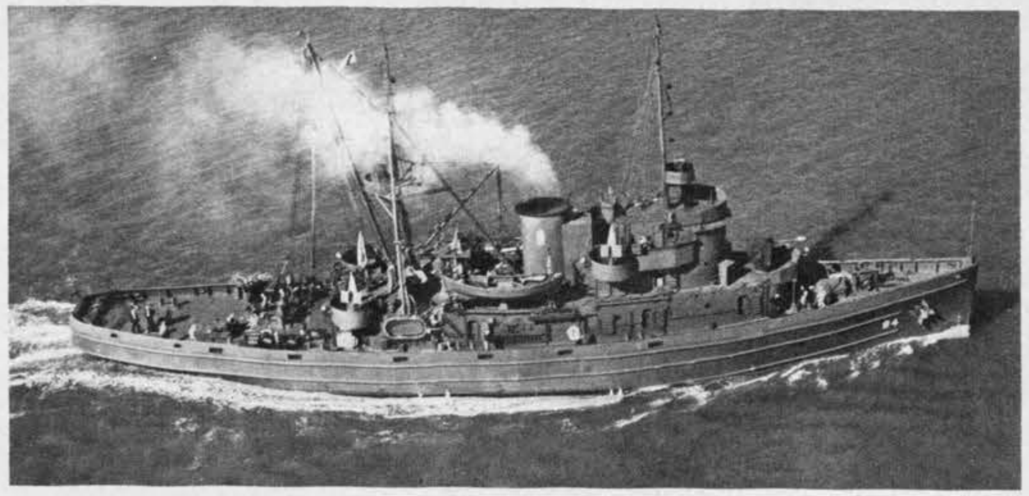


**MOTOR MINESWEEPERS** are the only district craft commissioned for action outside district. From a high bow the hull breaks down to a low deck. The stacks are short and straight.

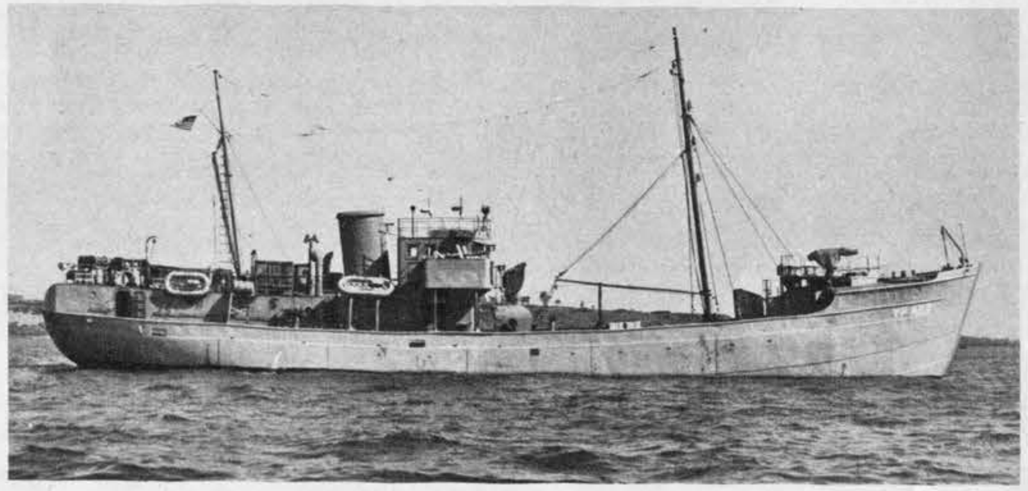
Of the myriad duties incidental to running a war at sea, many fall on the small ships. Minelaying and sweeping are two of these duties that are performed by a great variety of craft: specially designed types for all classes of action, converted trawlers and fishermen, ex-pleasure yachts. Other types lay and tend the anti-submarine nets that protect Allied harbors. Small boats of all varieties, incapable of sustained service at sea, patrol the coastal waters of the U. S. Large powerful seagoing tugs set off on long lonely missions across the seas towing barges, dredges, derricks, small floating drydocks and other equipment for our outlying bases.

Though many of these types are now being built to Navy designs, many of those currently in service have been adapted from their peacetime duties. Most of the district patrol vessels, for example, are converted trawlers and, despite the additions of guns, they still look like fishing craft. The oceangoing tugs, with sisters serving as submarine rescue vessels, salvage vessels and small seaplane tenders, are in many cases similar to those used in peacetime ocean towing service. Many of the craft used to check the papers of ships engaged in coastal traffic are the former luxury yachts of American millionaires.

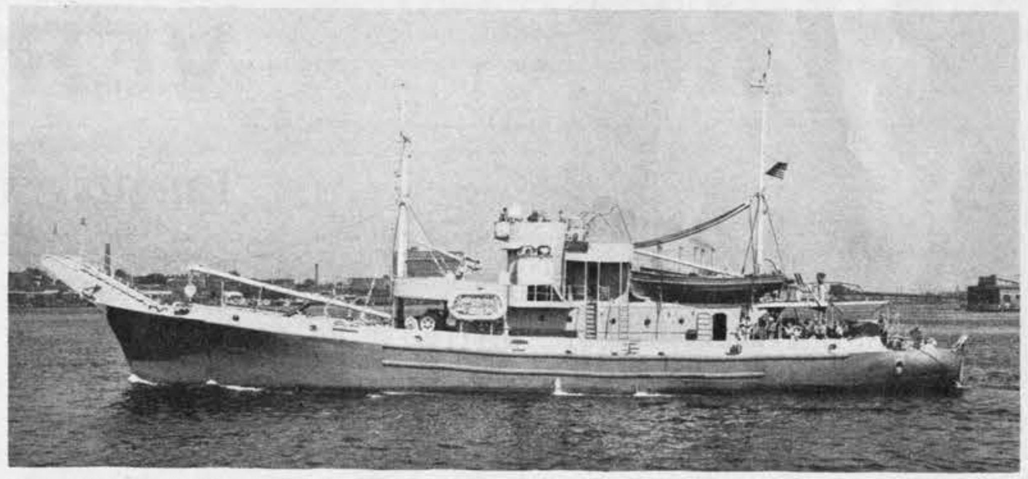
**RECOGNITION:** AM minesweepers of the Auk Class (*above*) are sturdy ships of moderate beam having a prominent bridge, tall foremast and two squat, widely separated stacks. The oceangoing tugs (AT's) are longer, more racy-looking craft than the usual harbor tug. The net tenders are small coastal craft distinguished by the net-handling gear projecting from the bow. Motor minesweepers (YMS's) may have either one or two short straight stacks amidships.



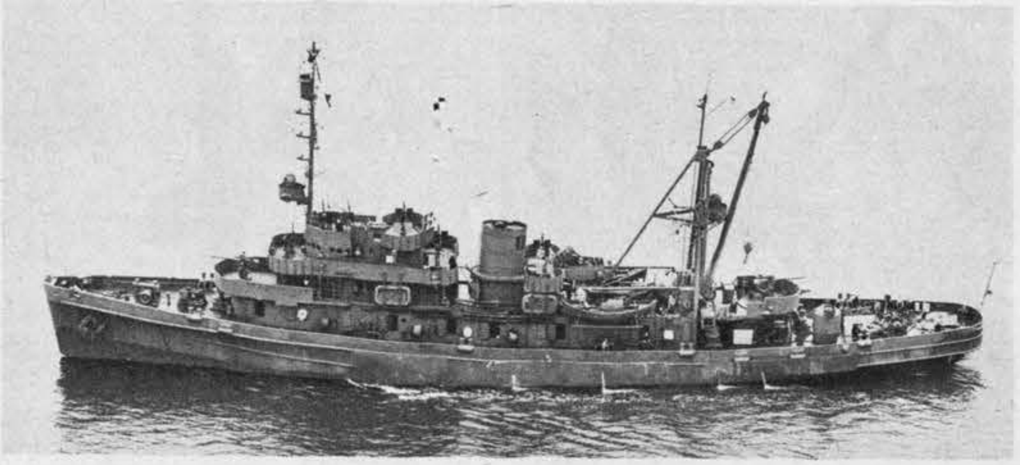
**OCEANGOING TUG,** the U.S.S. Cree, is longer than usual harbor tug. Superstructure forms mass around stack. Large crane rises from rear of deckhouse, supported by a tripod mast.



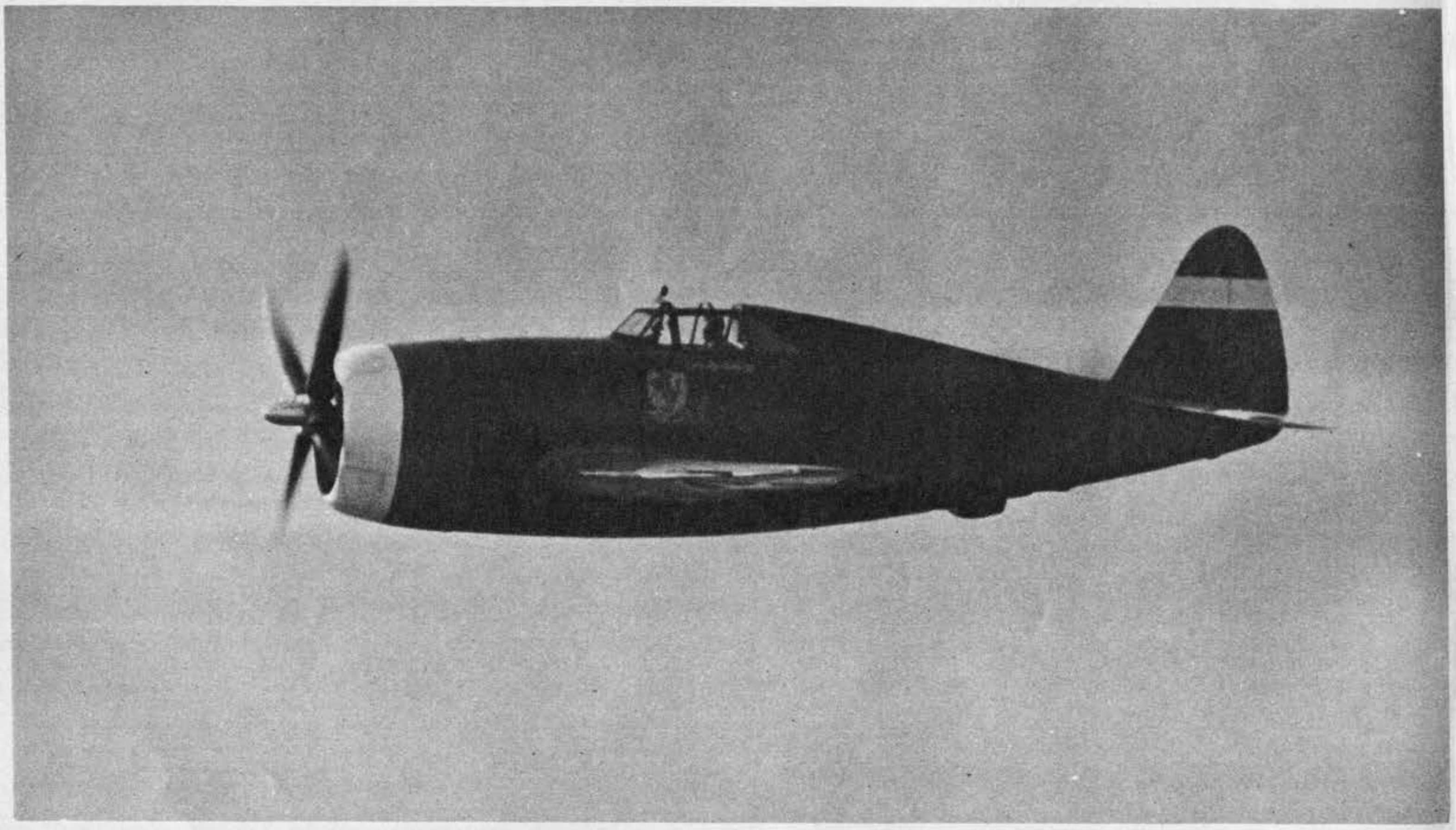
**DISTRICT PATROL VESSEL** (YP) is a converted trawler commissioned to patrol waters within one naval district. Superstructure is aft, well deck between the bridge and high bow.



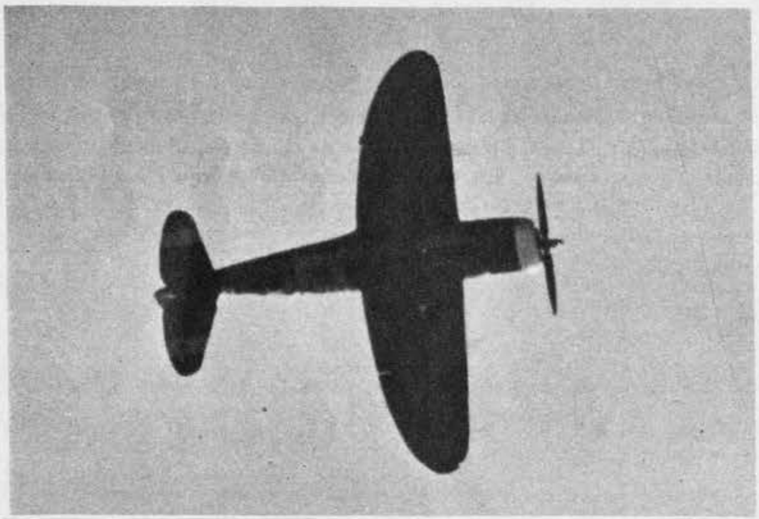
**TENDING THE NETS** which protect our harbors from submarines is the duty of ships like the YN 22. Chief distinction of net tender are the net-handling ramps projecting from bow.



**ONE VARIATION** of AT design is ASR or submarine rescue vessel. Chief distinction from AT is separated stack and superstructure. ASR may have clutter of rescue gear on after deck.



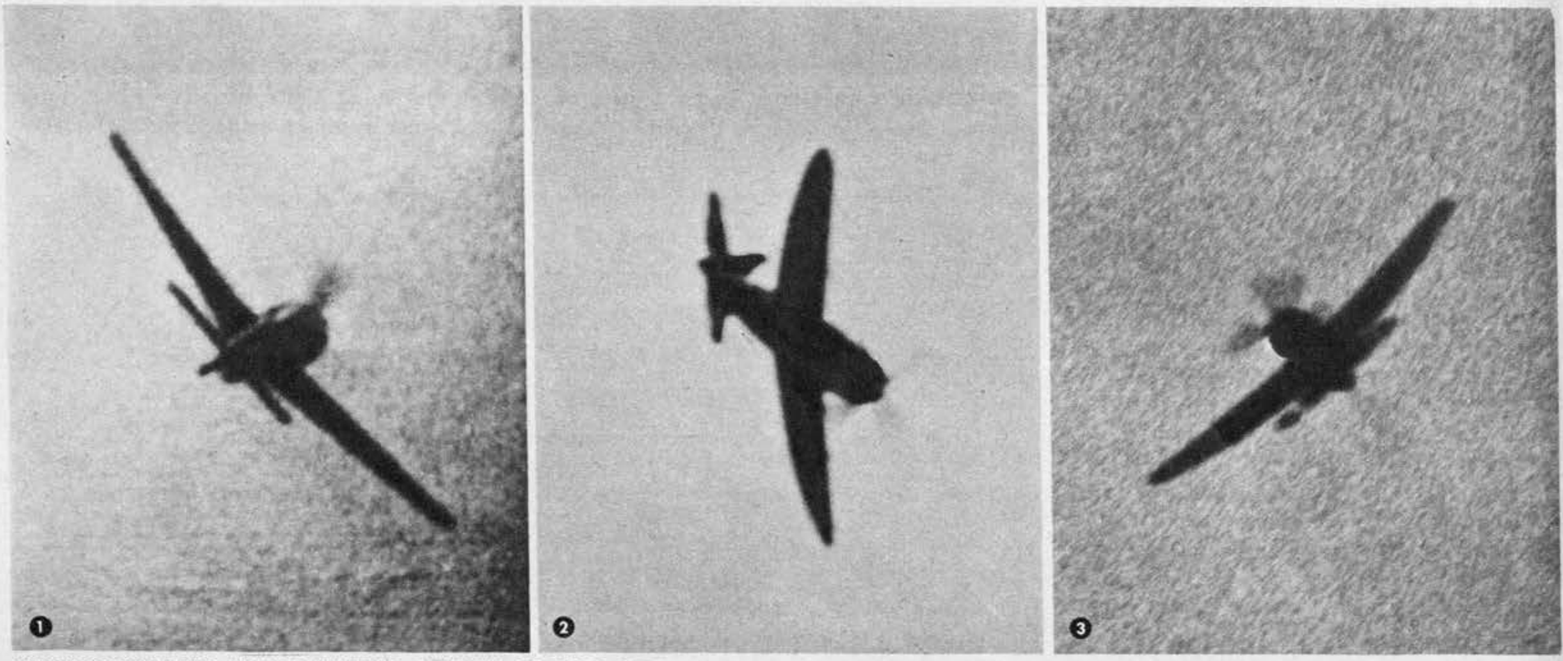
P-47's HUMPBACKED FUSELAGE MEETS STRAIGHT-EDGED FIN IN SHARP ANGLE. BELLY CURVE IS BROKEN BY SUPERCHARGER IN VIEW ABOVE



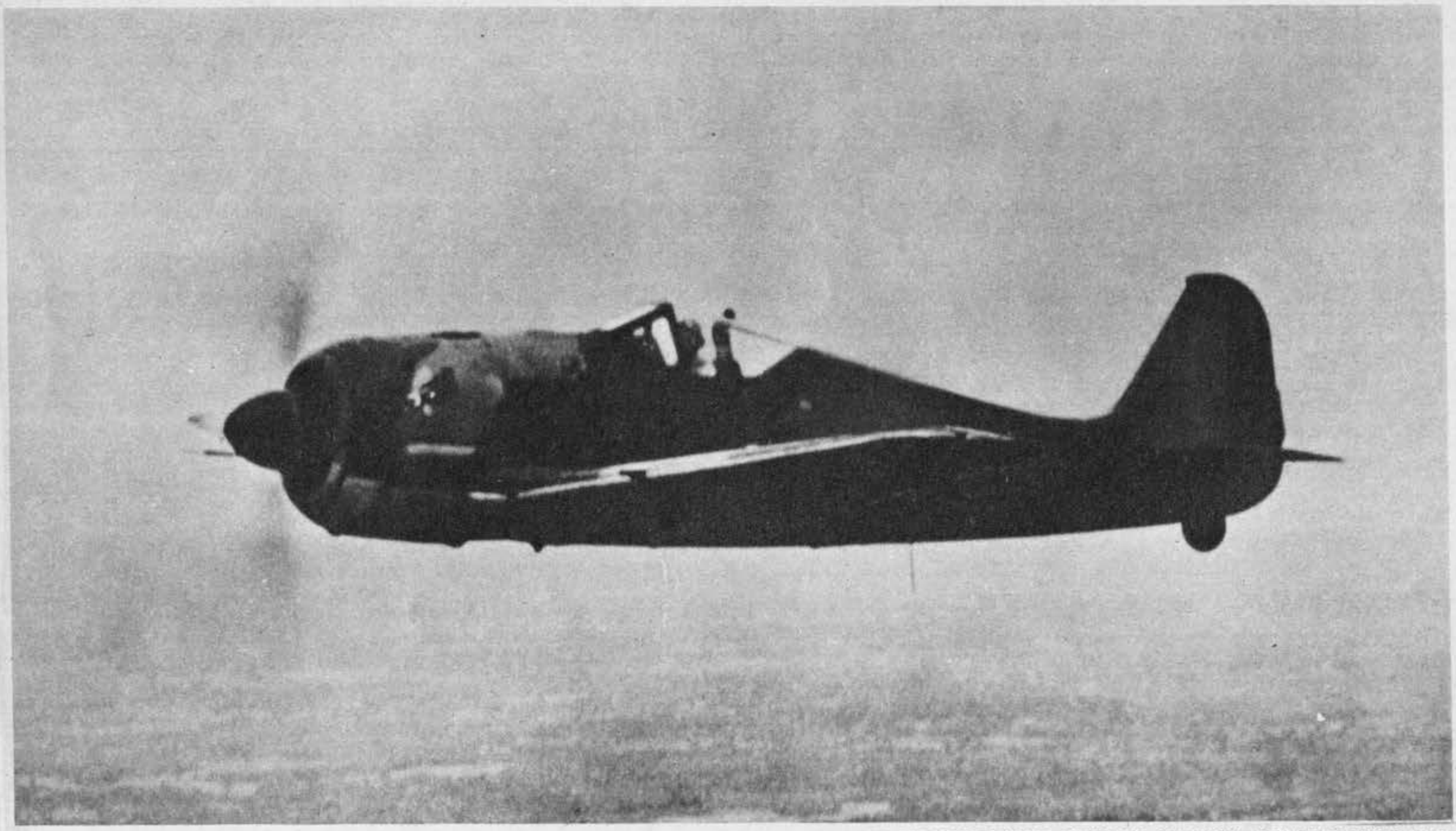
**OUTSTANDING DIFFERENCES** between Thunderbolt and FW-190 are evident in plan view; especially unmistakable is the graceful P-47 wing.

# FOCKE-WULF VERSUS P-47

## Tangling daily in Europe's skies they must be quickly told apart



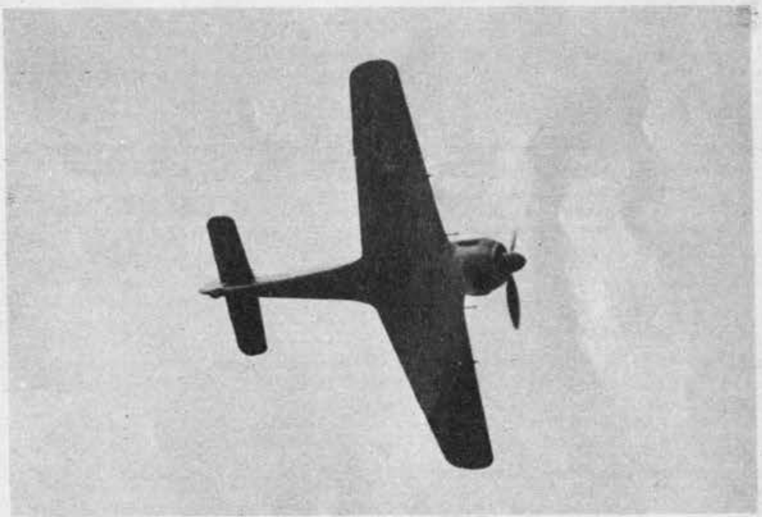
THUNDERBOLT AND FOCKE-WULF 190 OPERATE AT SAME ALTITUDES AT SAME TIME. IT IS ESSENTIAL THAT AIR GUNNERS AND PILOTS RECOGNIZE



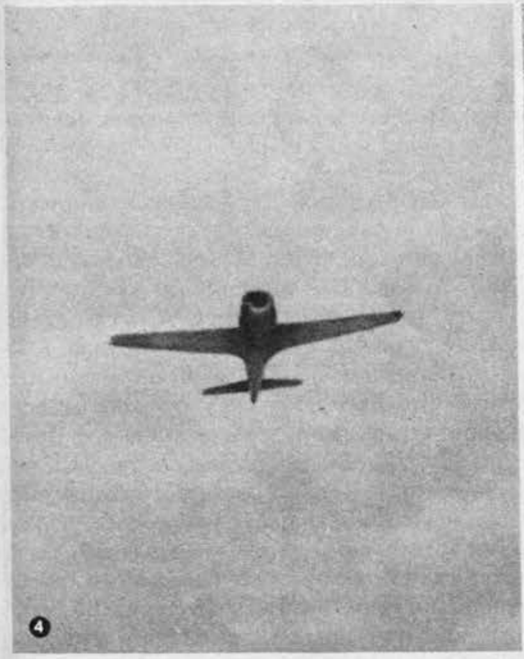
ROUND BLUNT NOSE OF FOCKE-WULF 190 IS EMPHASIZED BY UNUSUALLY LARGE SPINNER. FIN FAIRS INTO SLENDER STRAIGHT-BELLIED FUSELAGE

In the air battle now raging over Europe, two powerful high-altitude fighters are a prime recognition problem: the Focke-Wulf 190 and Republic's P-47. Both are land-based fighter planes with single radial air-cooled engines. Outside this basic resemblance they differ in many respects. FW-190's wing tapers equally and its slender fuselage tapers sharply to a point which extends well aft of the tailplane. P-47 has a very distinctive semi-elliptical wing; its fuselage is deeper, curves evenly into tail. Tailplane has a sharply tapered leading edge, and a rounded trailing edge, with cutout, in contrast to the boxy, rectangular tailplane of the Focke-Wulf.

The nose of the FW-190 is short, the cowling is a perfect circle and has a large spinner while the Thunderbolt has a long nose, a deep oval, inverted egg-shaped cowling, and a small propeller hub. The FW-190 is a low-wing plane with moderate dihedral and the P-47 is low mid-wing with marked dihedral. At the bottom of these pages are unidentified views of both planes. Answers are on p. 50.



**THIN FUSELAGE** of the FW-190 comes to a point, extends well beyond tailplane. Its squarish wing and tailplane are obvious recognition points.



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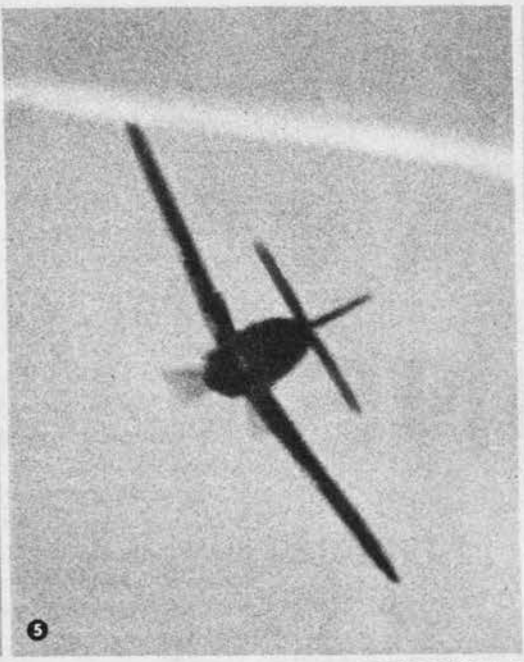

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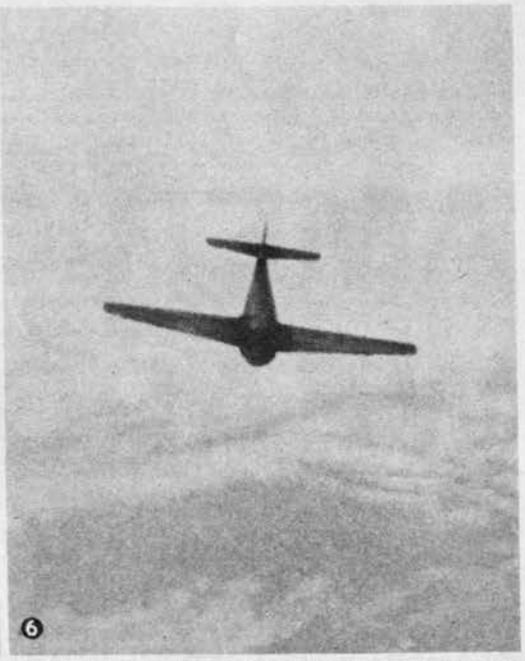

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THEM INSTANTLY IN COMBAT LEST OUR OWN PLANES BE SHOT DOWN THROUGH CARELESSNESS, OR ENEMY PLANES SLIP THROUGH OUR DEFENSES

CAMOUFLAGED M-3 MOVES ACROSS IDEAL TERRAIN IN ENFILADING ACTION. THE HALF-TRACK MOUNT OF THIS SELF-PROPELLED GUN BOGS DOWN IN SOFT GROUND, IS GRADUALLY BEING REPLACED BY FULL-TRACK MOUNTS

# AMERICAN WEAPONS

## U. S. develops fine self-propelled artillery for fast mobile warfare

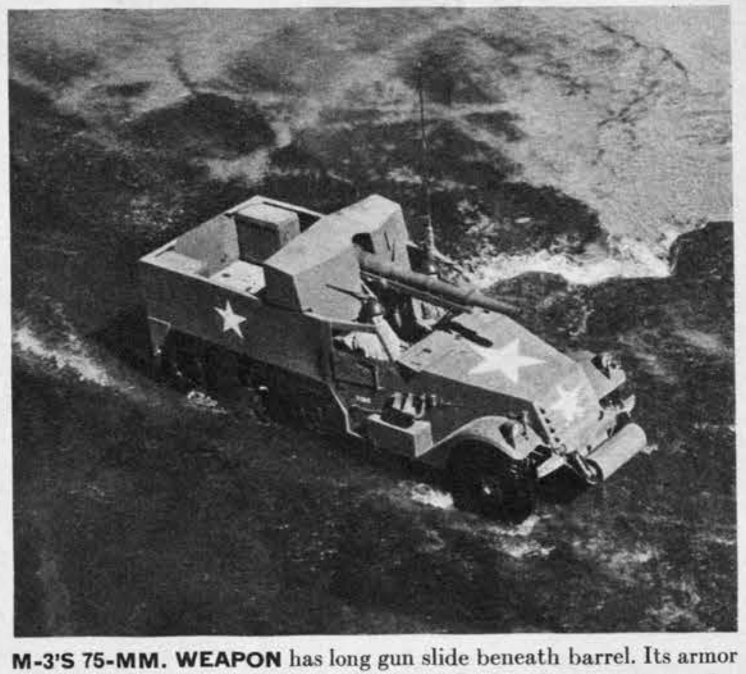
German blitz tactics are largely responsible for the development of the self-propelled gun in this war. The Allies adopting the new weapon did so not in imitation of the Wehrmacht but in response to a real need for increased armored mobility to cope with the rapid German advance. Now that the German Army is on the defensive and blitz warfare is on the decline, self-propelled guns have lost some of their initial operational value. In numbers they are far less important than towed artillery. They are more vulnerable in size and weight and on long runs their complicated track gear wears out more quickly. But the self-propelled gun still remains a dangerous special-purpose weapon because it can get into firing position almost immediately, without emplacement.

Convinced that the self-propelled artillery weapons with their mobility, armor protection and firepower were necessary adjuncts to towed artillery in modern warfare, the U. S. Army started early to develop such mounts and now has a series ranging from the small 75-mm. howitzer to the huge 155-mm. gun. Our earliest tank destroyer was the standard American half-track with the old field artillery 75-mm. gun mounted on it. The M-3 shown on these two pages is just such a weapon, a 75-mm. gun on a half-track. The 75-mm. howitzer on a half-track, the T-30, and the 105-mm. howitzer on the same mount, the T-19, were other early U. S. self-propelled artillery. Our fast half-track mount has been a useful expedient but it cannot carry the armor protection necessary to do battle with tanks, nor can it keep up with full-track vehicles in bad terrain. Gradually the half-track M-3 has given way to the M-10 (page 44), a full-track medium-tank chassis with 3-inch gun. The T-30 has become the M-8 (page 46); The T-19, the M-7 Priest (page 43).

These early half-track weapons have piled up good battle records in the Pacific and in Africa. Many are still in use. Some time before Pearl Harbor a consignment of M-3's was shipped to the Philippines, not put into operation until the Jap attack. Green gun crews hastily assigned found them easy to manipulate, repulsed wave after wave of Jap tank attacks in the delaying action north of Manila.

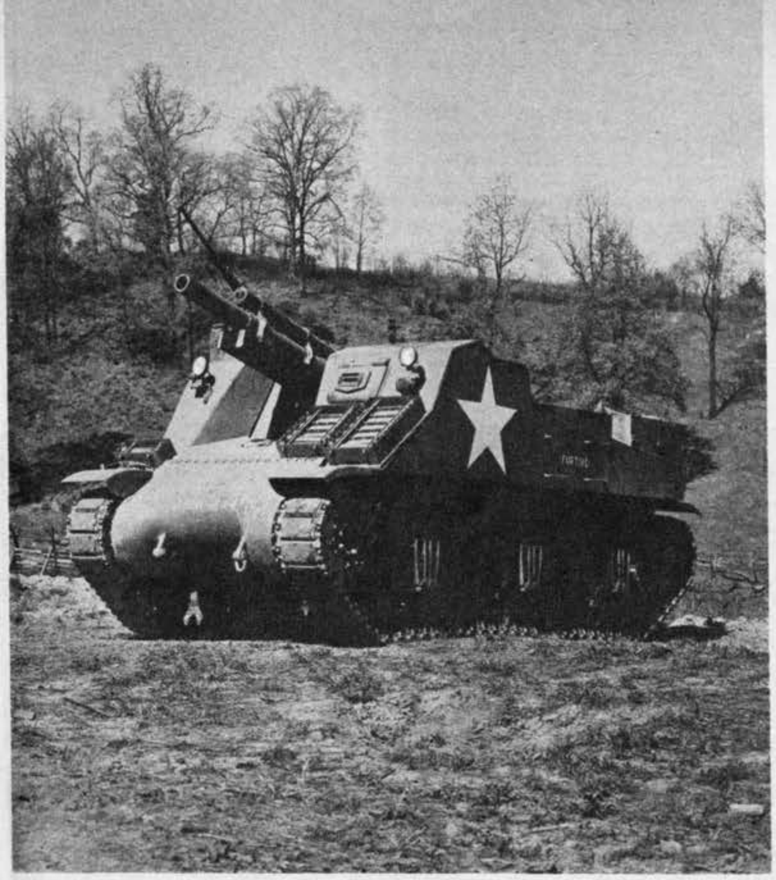
**NEAR SALERNO** M-3's came to relieve a handful of weary Rangers who were fighting to hold the Chiunzi mountain pass. This M-3 is firing on camouflaged German machine-gun positions just beyond the pass.

**MARINES ON BOUGAINVILLE** used the M-3 to shatter Jap pillbox strongholds. In the early stages of amphibious operations self-propelled guns can drive right out of landing craft, firing their big guns on the way.

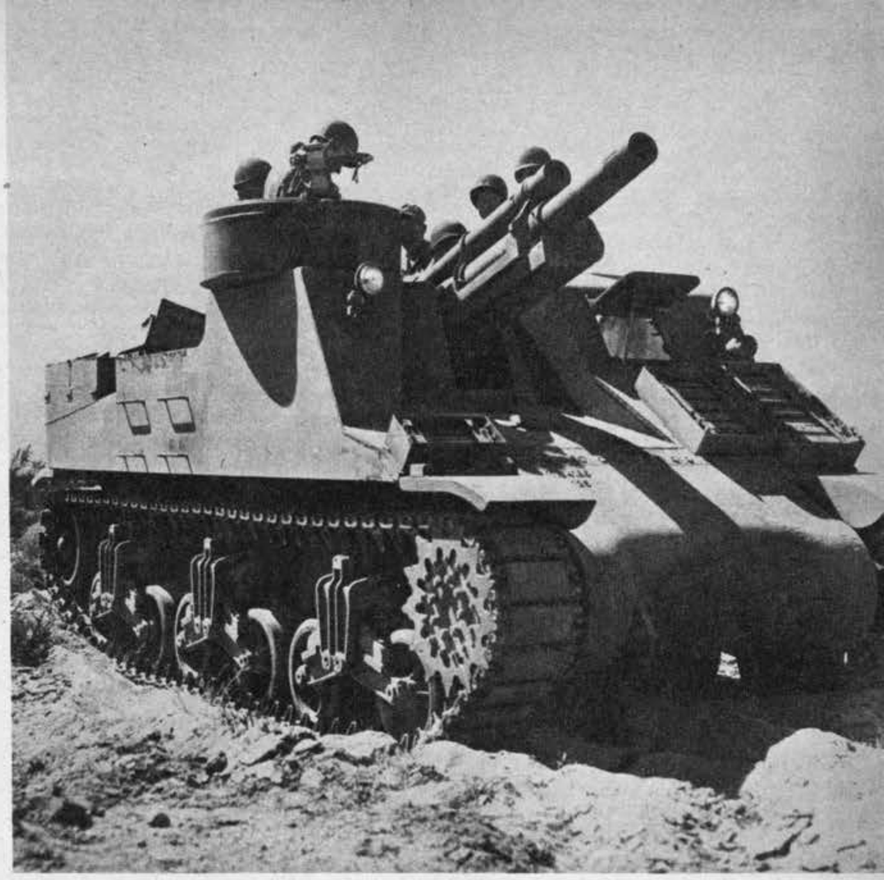


**M-3'S 75-MM. WEAPON** has long gun slide beneath barrel. Its armor is slight. The gun shield, a simple affair, is not much more than a flat forward wall. The gross weight of the gun and chassis is only 19,000 lb.

Battle-line hitch-hikers ride
to front on sturdy M-7 Priest



**SHORT, HEAVY-BARRELED GUN** has over-and-under recoil mechanism visible in most views. Frontal shield protects crew from ground fire.



**PRIEST'S PULPIT** forms mount for a .50-cal. AA gun, is prominent feature of design. Tandem bogies are typical of most U. S. tracked vehicles.

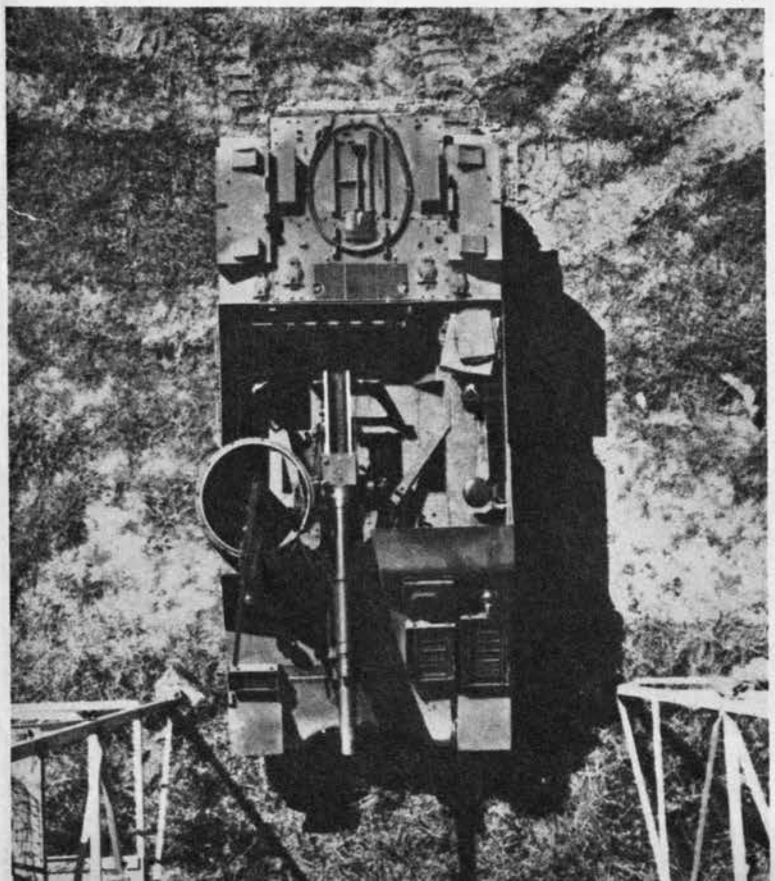
# ROMMEL WRECKER

## U. S. 105-mm. howitzer nullified Nazi 88-mm. all-purpose gun in Tunisia

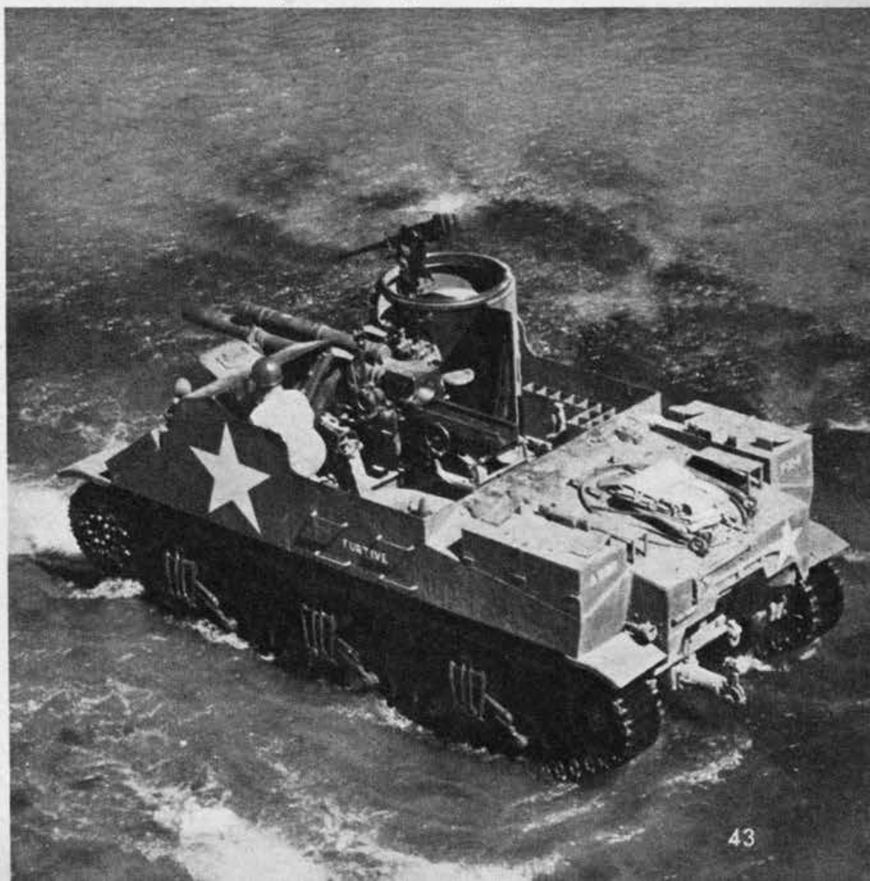
One of the first American self-propelled weapons to go into action, the M-7 has more than proven its worth in the field. Used at El Alamein and throughout the Tunisian campaign, it sparred effectively with Rommel's famous 88-mm. piece. A group of Priests would lob HE over miles of Axis-held lines with the shells fused to explode just off the ground. This would force the 88's to open up in an attempt to silence the attack. As soon as the German gun positions were disclosed, our heavy artillery would wipe them out as our tanks advanced or detoured through their known positions.

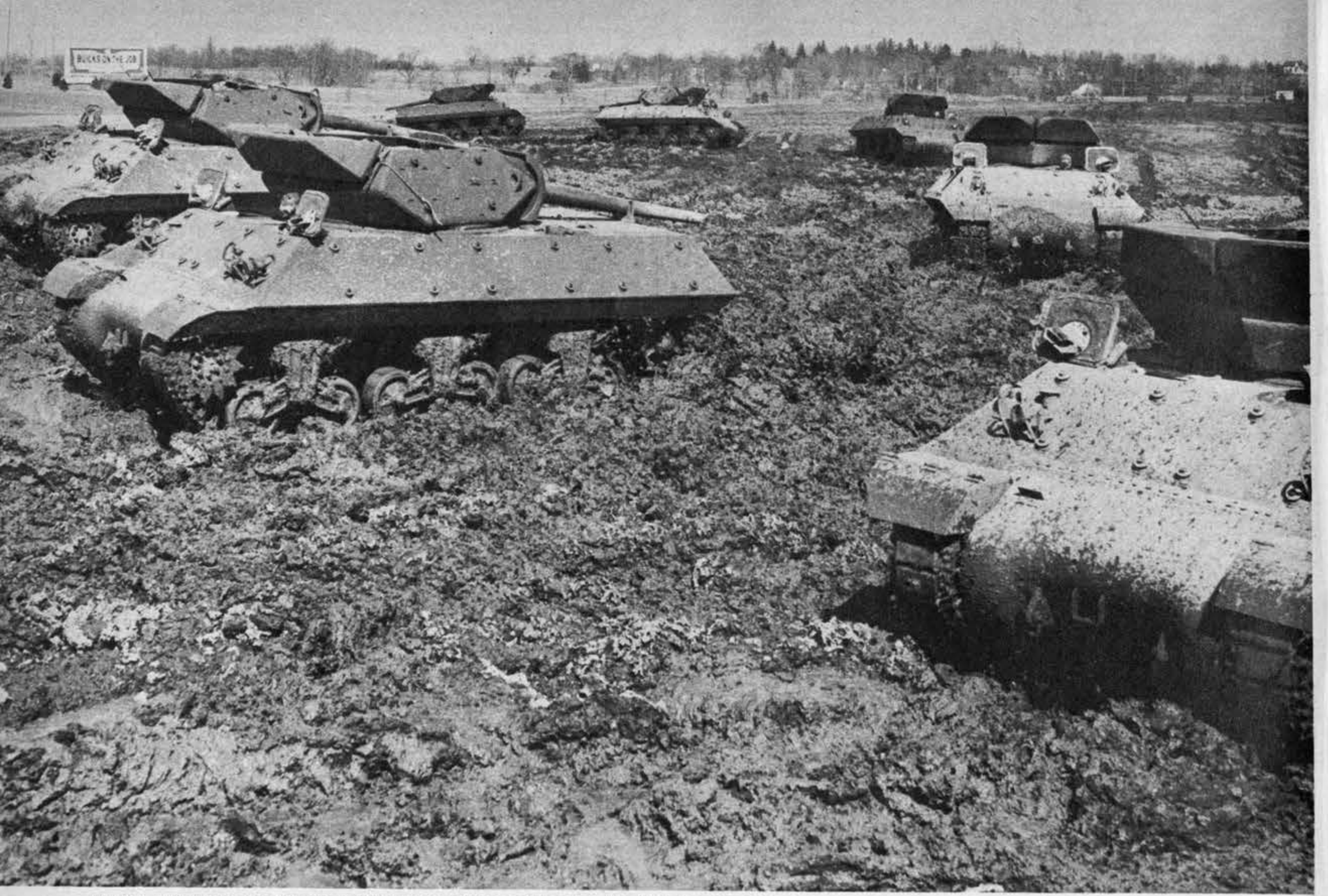
**RECOGNITION:** The M-7 is a 105-mm. howitzer mounted on the typically American chassis of the M-3 General Grant tank. Each track runs on three pairs of small tandem bogies with drive sprocket forward, idler at rear. The gun fires through the front shield slightly to the right of center. A circular AA pulpit, which gives the weapon its name, is mounted at the right forward and dominates most views of the weapon. Gun platform is open rectangle.

**IN PLAN VIEW,** M-7 is almost perfect rectangle, with its gun platform a smaller rectangle forward. Gun barrel ends flush with forward hull edge.

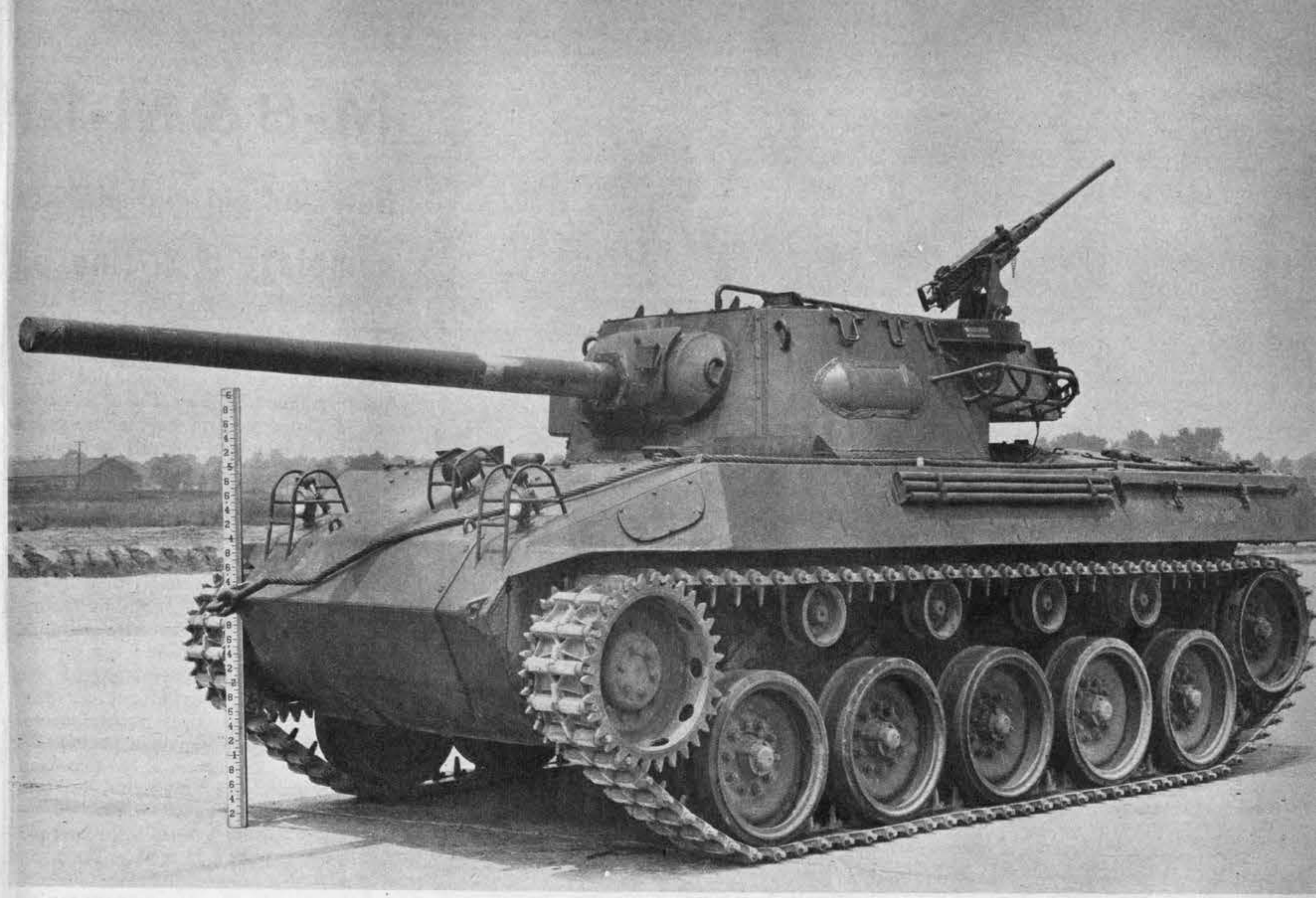


**BUILT-UP SHIELD,** heavy appearance forward, contrast with low boxy rear. Gun is field howitzer (minus trails, wheels), bolted to tank chassis.





M-10'S AWAITING SHIPMENT HAVE 3-INCH GUNS POINTING BACKWARDS. WEDGES FASTENED TO REAR OF TURRET GIVE IT WINGLIKE SILHOUETTE



T-70 HAS LONG 76-MM. GUN AND CHRISTIE-TYPE SUSPENSION SYSTEM OF LARGE DOUBLE EVENLY SPACED BOGIES, FIVE ON EACH SIDE OF CHASSIS

# M-10 & T-70

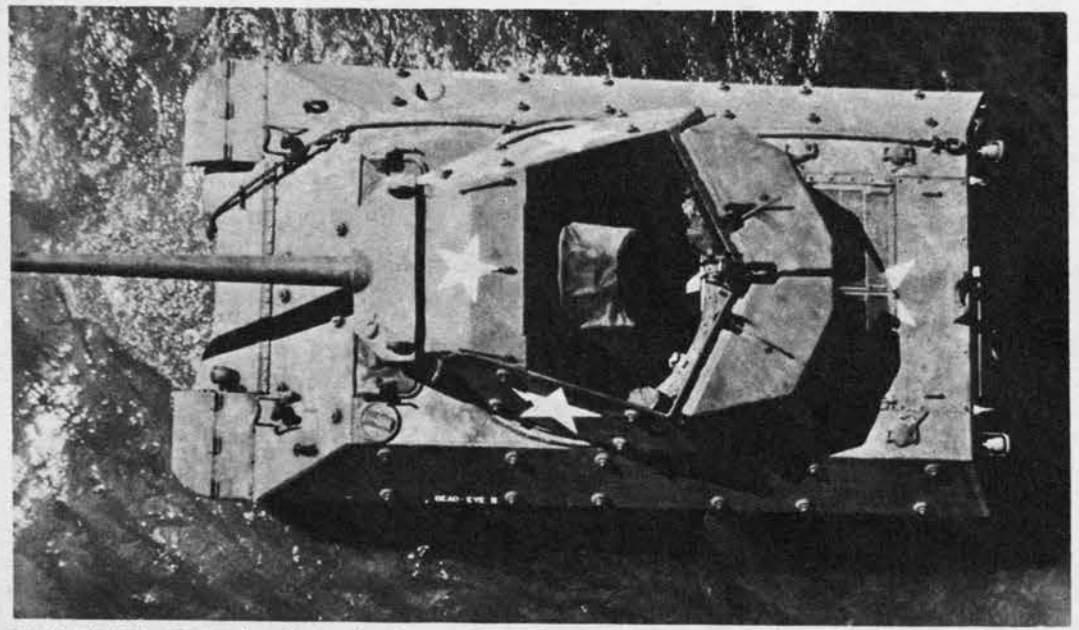
## One self-propelled gun is seasoned campaigner. The other is brand new

Firing projectiles with delayed-action fuses that pierced Nazi tank armor and detonated inside, U. S. M-10 tank destroyers in Tunisia tore the much-vaunted German Mark VI's wide apart. The M-10 is one of our heaviest self-propelled guns, sturdily armored and designed to be more than a match for any kind of tank the Germans can put into combat. It is mounted on our most successful tank chassis, M-4 General Sherman, and its 3-inch gun is effective against any enemy tank armor. Altogether 36 M-10's ride in a tank destroyer battalion, each equipped with a .50-cal. antiaircraft machine gun, in addition to the 3-inch main weapon.

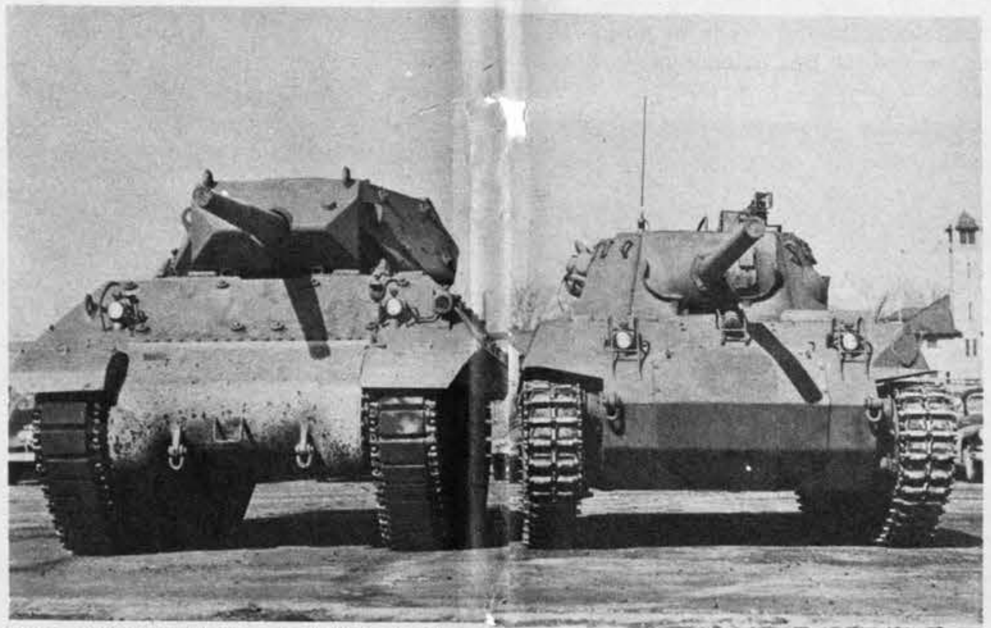
For those who think that a tank destroyer should be the fastest thing on a battlefield, the M-10's speed of 22 miles per hour is a little slow. Tank destroyers must be able to play a deadly game of hide-and-seek, spotting their target, moving to prepared positions, waiting, and firing at short, sure ranges. The 8-ft. silhouette of the M-10 is pretty high for successful hiding. Best protective feature is the slope of hull and turret surfaces which show distinct advance in design and welding for deflecting of enemy projectiles.

The T-70 (*above*) is our latest tank destroyer. So far it has had no combat experience in which to prove itself, but it promises to be a fast, hard-hitting anti-tank gun that may supersede the M-10. Compared with the latter, the T-70 is almost a foot shorter in height, is 20,000 lb. lighter when fully equipped, and has twice the speed of the older mount. Its 76-mm. weapon has a higher velocity and flatter trajectory than earlier guns, and although longer and heavier than its predecessors it is so mounted that its turret moves smoothly and easily in a 360° traverse.

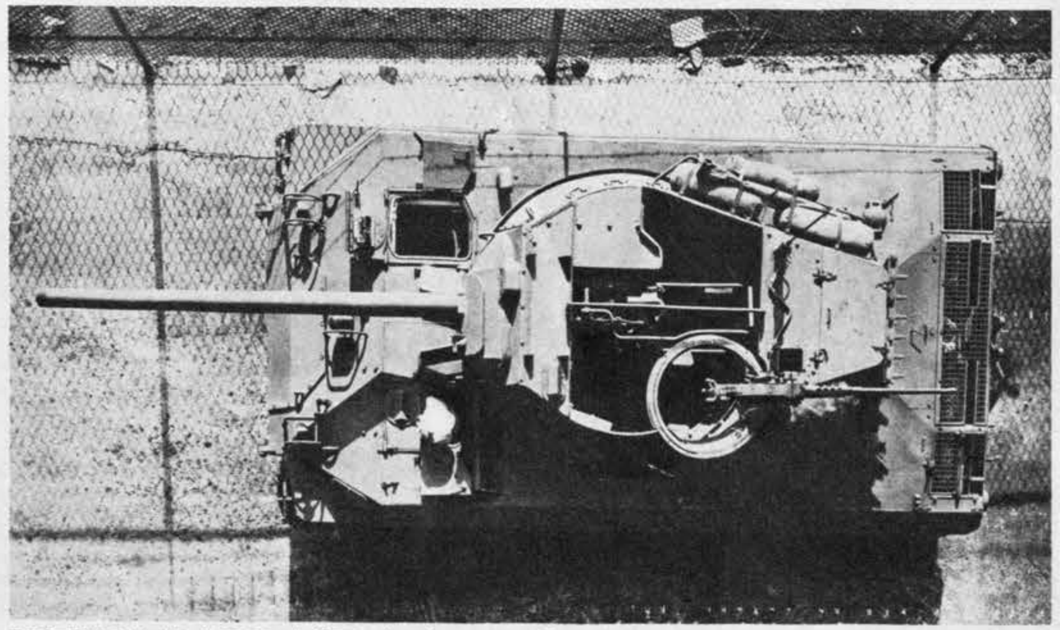
**RECOGNITION:** The M-10's tandem bogie wheels are typical of most U. S. mounts. First of our armored vehicles to deviate from this pattern is the T-70 with its Christie-type suspension system of five double evenly spaced bogies and four double return rollers on each side of the chassis. This originally American-designed suspension system is an old favorite with the Russians and Germans.



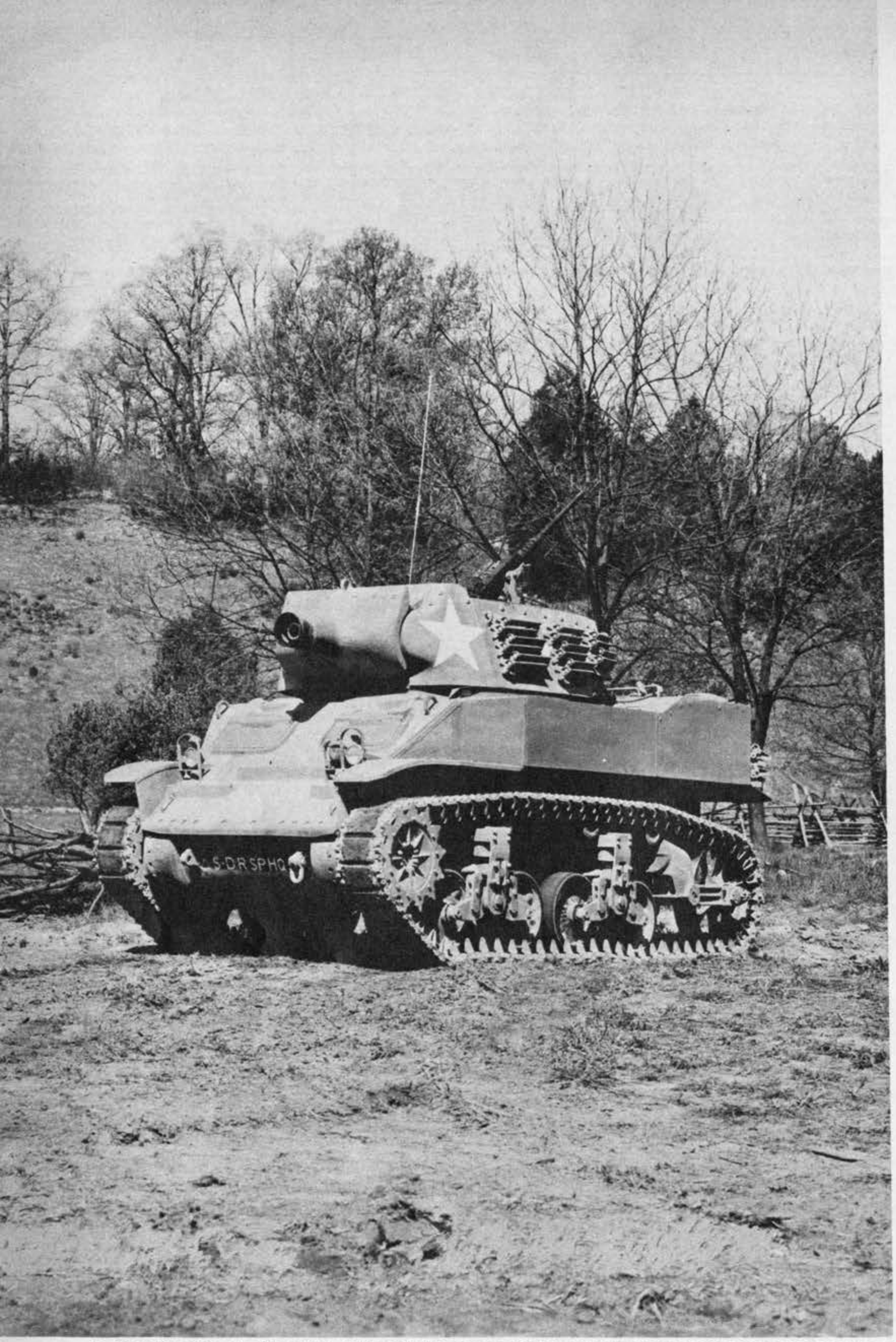
**M-10 FROM ABOVE** has long unbroken rectangular lines, squares off abruptly at rear. Its long, thin-barreled gun projects well beyond bow and the open-topped turret has an odd pentagonal shape.



**SIDE BY SIDE** M-10 and T-70 look different. Taller M-10 (*left*) has deep, rounded bow, jutting gun mantlet. T-70's bow slants, is boxlike. Its mantlet is round and bulbous.



**RECTANGULAR LINES** of T-70 chassis contrast with open pear-shaped turret, roundest at barrel base. Ring mount of .50-cal. anti-aircraft machine gun breaks curve of turret at left rear.



M-8'S DESIGN IS CLEAN, WELL-INTEGRATED. SLOPE-SIDED TURRET HAS A BULGING GUN MANTLET

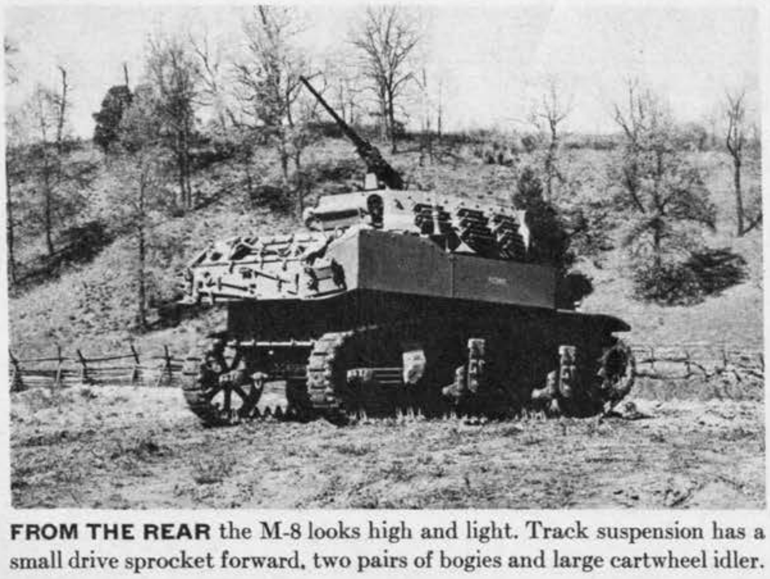
# M-8 & M-12

## New and old gun mounts complete U. S. line-up

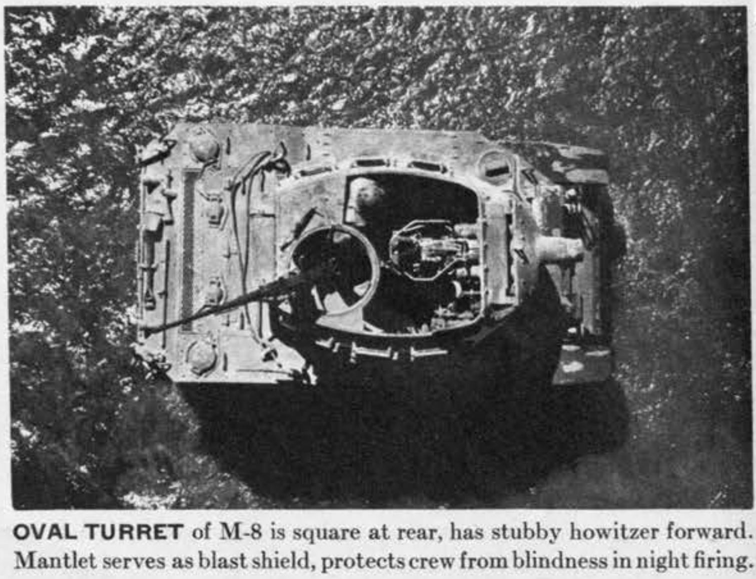
The two guns shown on these pages illustrate the marked differences between a weapon designed for its specific task and a quick wartime expedient. The M-8 (*left*) is one of the newest of our self-propelled mounts. It is now in quantity production and has been landed in Italy. It was designed as a mobile weapon to go forward with the armored force for reconnaissance and close support. From an advanced position the M-8 can throw ammunition at the enemy lines to flush targets, then use its high speed to get away. The stubby 75-mm. howitzer is also a fine weapon for searching the invisible far side of hills.

The M-12, on the opposite page, is one of the largest self-propelled guns in operational use. It had considerable success against enemy strong points in Tunisia. Essentially, the weapon is a 155-mm. gun originally built as a towed gun in World War I, mounted on an M-3 chassis. There is no turret and the gun platform has only a light armor shield. In service, the M-12 is often dug in before firing. The tailspade is dropped to absorb recoil shock. Ammunition for the gun is in separate components, projectile and powder bags, and is carried on a separate motor carriage. The M-12 is not fired in motion and is used primarily against enemy artillery and installations, not against personnel.

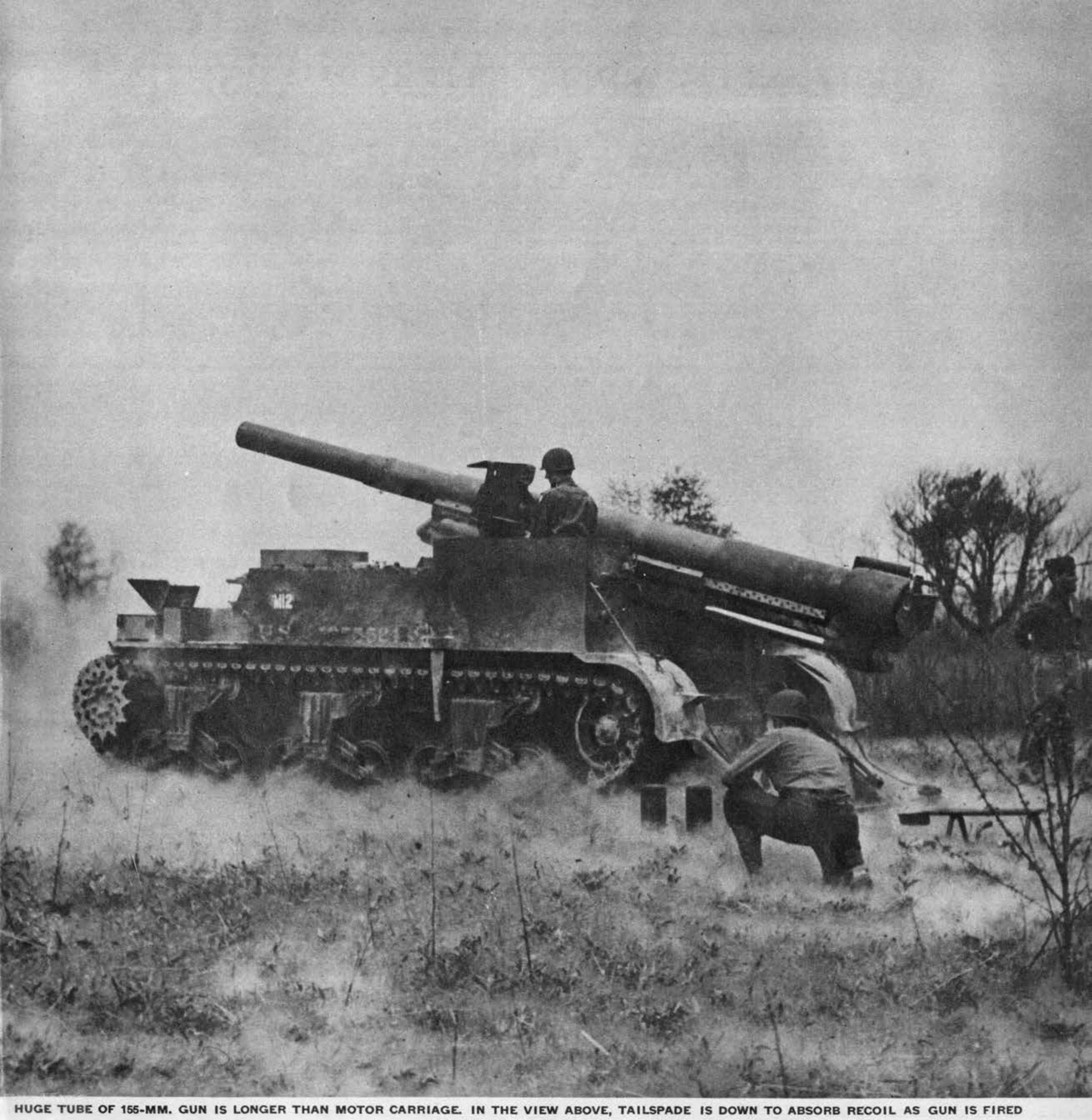
**RECOGNITION:** The M-8 is a four-place weapon on an M-5 light tank chassis having two pairs of tandem bogies. The turret is a long oval covering most of hull. It is open-topped and has a ring mount for a .50-cal. AA gun at right rear. Hull is angular and projects over the tracks. The motor carriage of the M-12 is long and flat with a light armor shield above the tracks. In motion, the tailspade is retracted, while in action the breech end of the gun extends behind hull.



**FROM THE REAR** the M-8 looks high and light. Track suspension has a small drive sprocket forward, two pairs of bogies and large cartwheel idler.

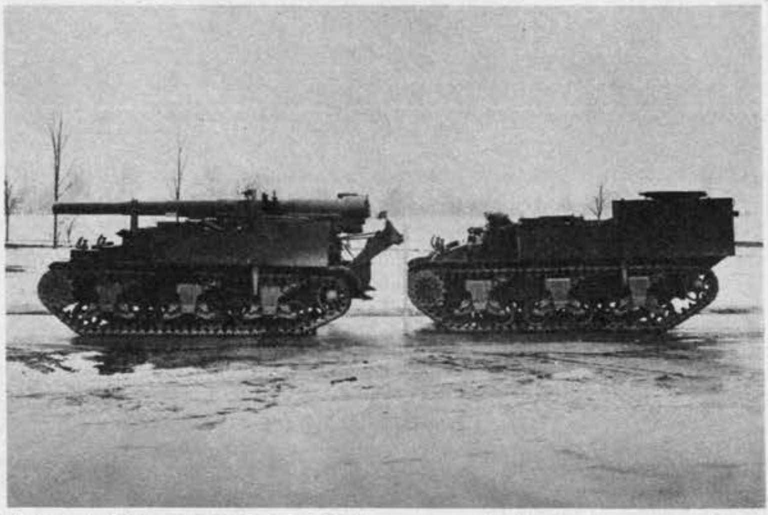


**OVAL TURRET** of M-8 is square at rear, has stubby howitzer forward. Mantlet serves as blast shield, protects crew from blindness in night firing.



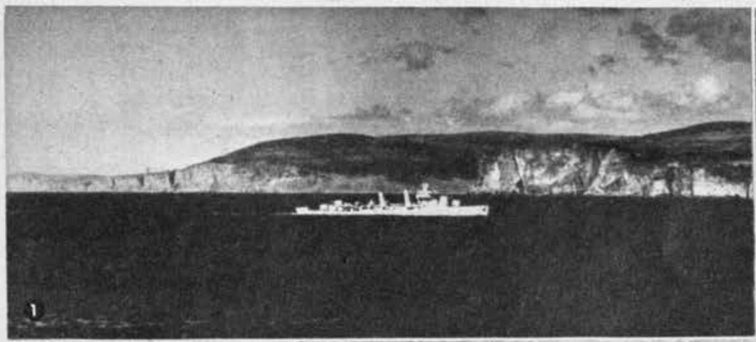
HUGE TUBE OF 155-MM. GUN IS LONGER THAN MOTOR CARRIAGE. IN THE VIEW ABOVE, TAILSPADE IS DOWN TO ABSORB RECOIL AS GUN IS FIRED

**M-12 IN MOTION** looks like what it is, a very big gun mounted on a tank chassis. Only apparent addition to major elements is light armor shield.



**MOTORIZED CARGO CARRIER** accompanies M-12. Separate caisson looks like M-12 without gun, has truck-like body to hold shells, powder.

# QUIZ NO. 3: SPOT THESE WARSHIPS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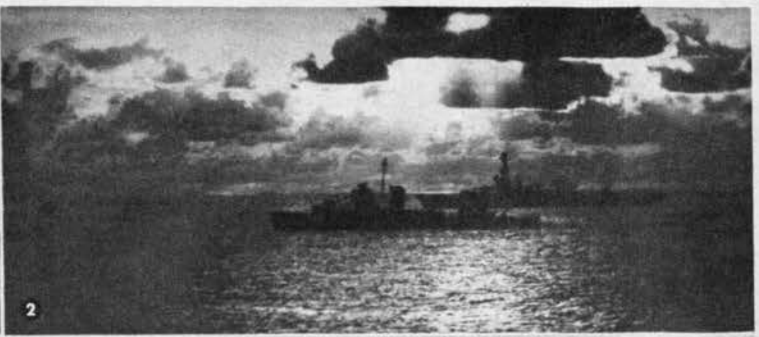
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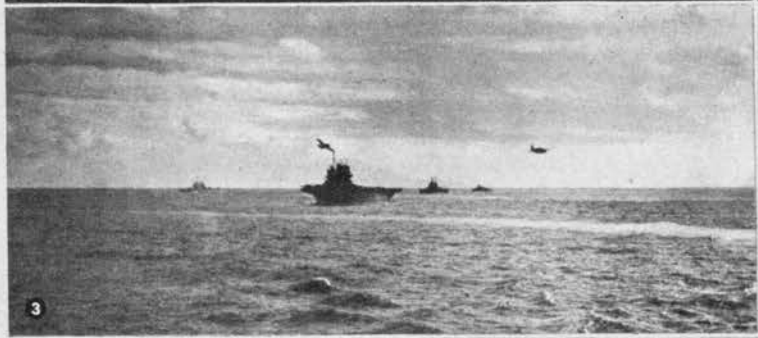
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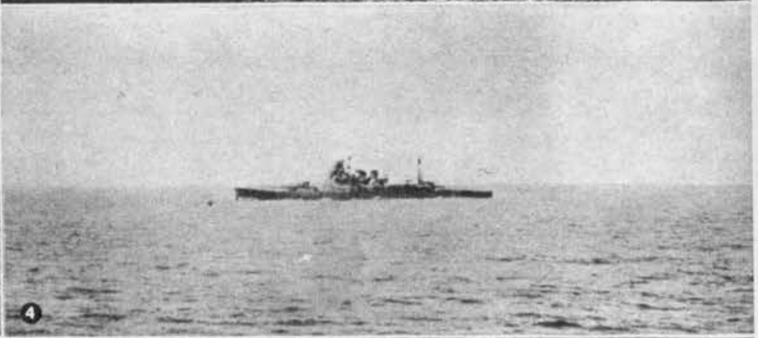
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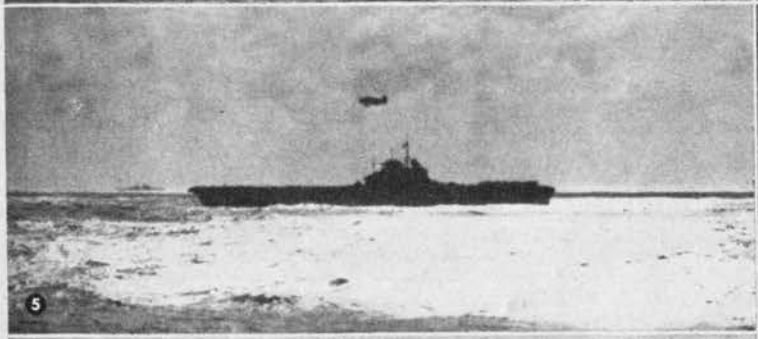
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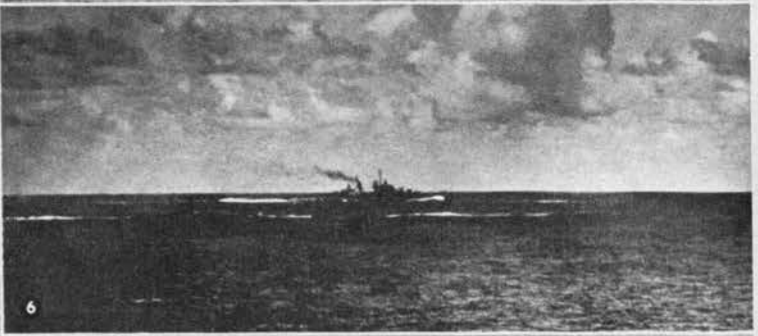
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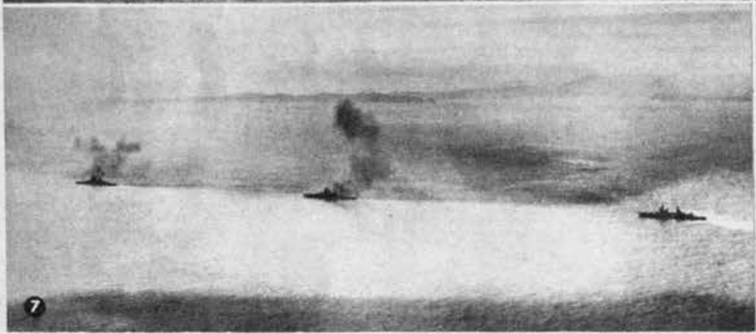
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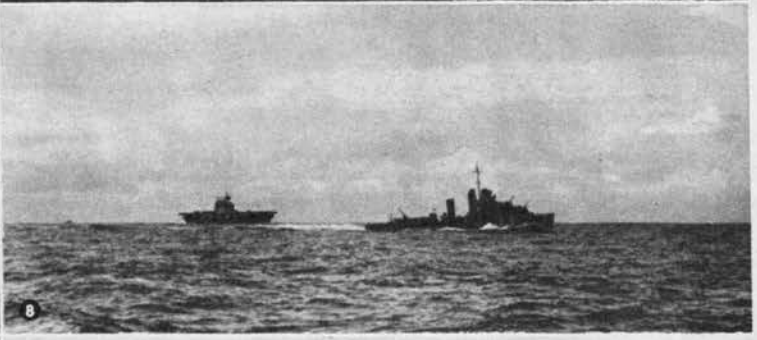
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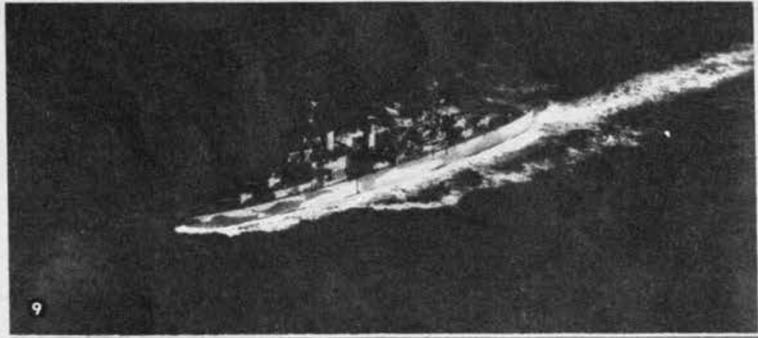
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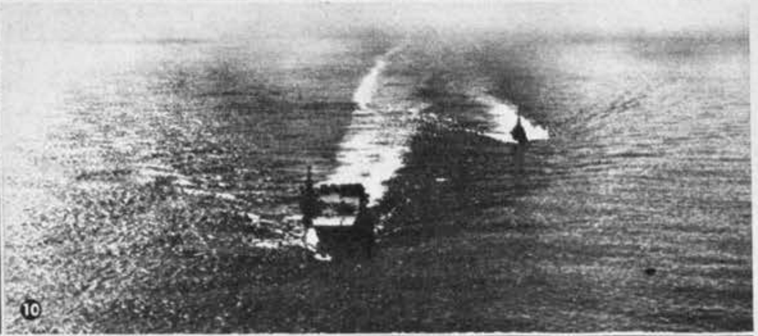
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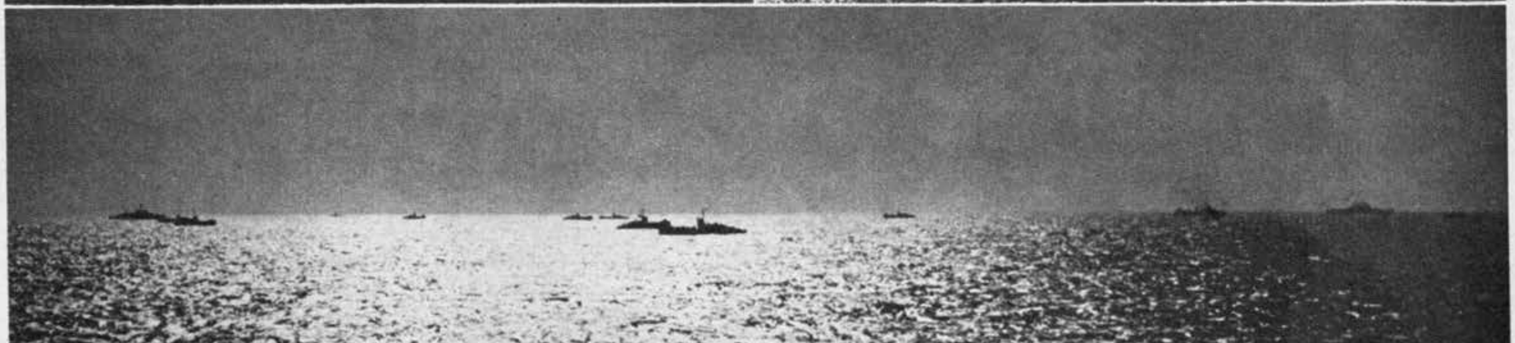
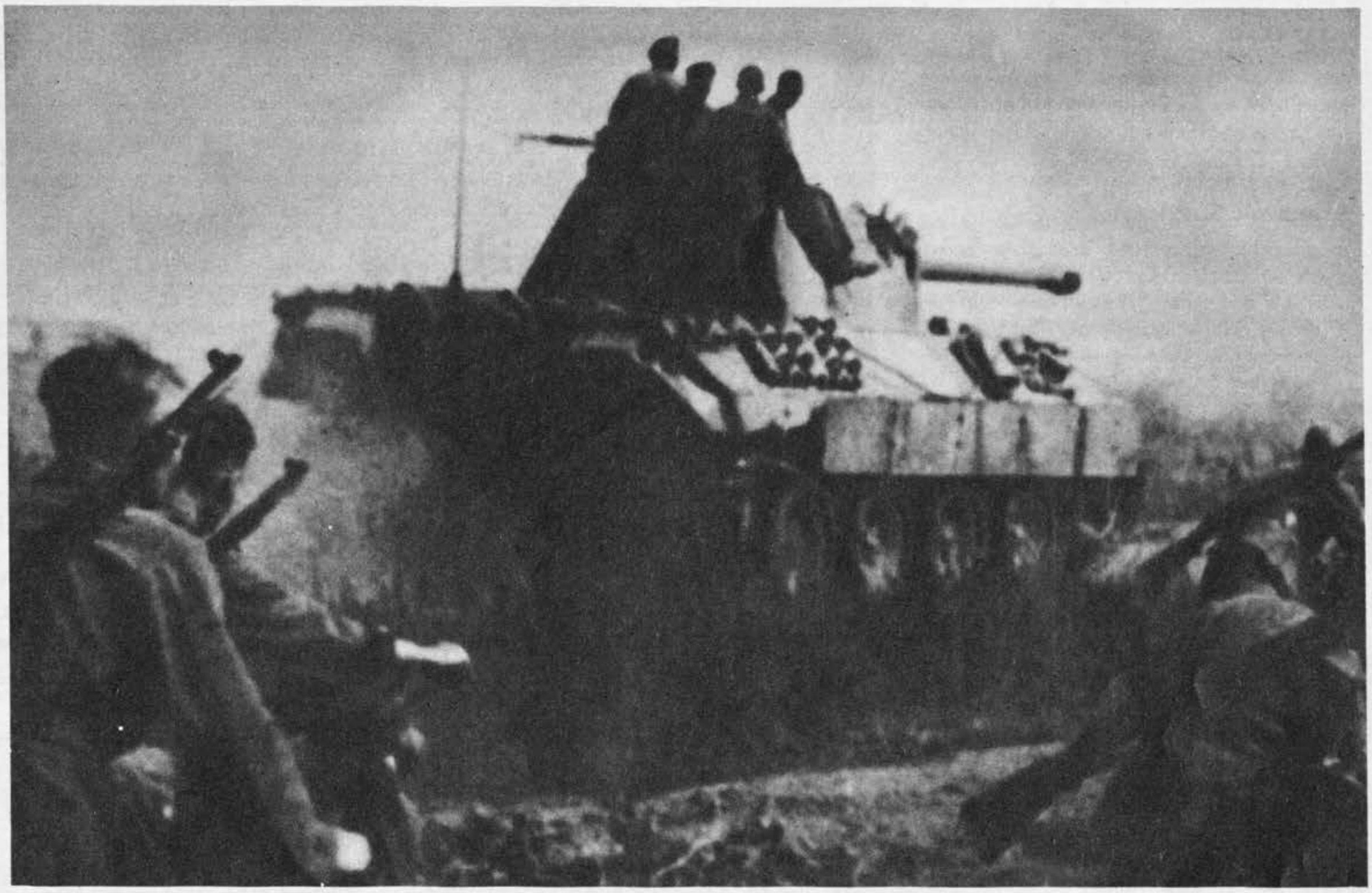

11

**For answers, see p. 50**



NEWEST GERMAN TANK IS 45-TON PzKw V PANTHER. PzKw VI-TYPE SUSPENSION GIVES SPEEDS UP TO 31 M.P.H. GUN IS LONG, THIN 75-MM. WEAPON

# RECOGNITION TRAINING LIST

JANUARY, 1944

The lists below include the armored vehicles of various combatant nations which are considered important enough at present to be included in recognition instruction. Vehicles almost identical in appearance are grouped together, and only one of such a group need be taught. For example, all U. S. half-tracks look very much alike, and only one need be taught in detail. However, pictures of the others can be introduced for interest.

The most important vehicles are indicated by an asterisk (*). The importance of each vehicle may change with time and area of combat. The *Journal* will print timely amendments to this list.

## UNITED STATES VEHICLES

SCOUT CAR, M-3A1
*LIGHT ARMORED CAR, M-8
ARMORED UTILITY CAR, M-20
*HALF-TRACK CAR, M-3 (M-2, M-4, M-5, M-9A1)
MULTIPLE GUN MOTOR CARRIAGE, M-15
MULTIPLE GUN MOTOR CARRIAGE, M-16 (M-13, M-14, M-17)
*LIGHT TANK, M-5A1 (M-5)
LIGHT TANK, T-9E1
MEDIUM TANK, M-3 (M-3A1, M-3A2, M-3A3, M-3A4, M-3A5)
*MEDIUM TANK, M-4 (M-4A2, M-4A3, M-4A4)
MEDIUM TANK, M-4A1
*75-MM. HOWITZER MOTOR CARRIAGE, M-8
*105-MM. HOWITZER MOTOR CARRIAGE, M-7
3-INCH GUN MOTOR CARRIAGE, M-10 (M-10A1)
76-MM. GUN MOTOR CARRIAGE, T-70
155-MM. GUN MOTOR CARRIAGE, M-12

## BRITISH VEHICLES

HUMBER ARMORED CAR
DAIMLER ARMORED CAR
A. E. C. ARMORED CAR
ARMORED CAR, T-17E1
OTTER ARMORED CAR
LYNX ARMORED CAR
UNIVERSAL CARRIER
*CROMWELL TANK
*CHURCHILL INFANTRY TANK
SP 25 PDR. (SEXTON)

## RUSSIAN VEHICLES

ARMORED CARRIER AND PRIME MOVER (STZ)
LIGHT TANKS (T-40, T-50, T-60, T-70)
VALENTINE TANK
MEDIUM TANK, T-34
HEAVY TANK, KV-I
HEAVY TANK, KV-II

## GERMAN VEHICLES

4-WHEELED ARMORED CAR, SD KFZ 222 (SD KFZ 221)
6-WHEELED ARMORED CAR
*8-WHEELED ARMORED CAR
ARMORED HALF-TRACK VEHICLES
HALF-TRACK VEHICLES
*PzKw III TANK
*PzKw IV TANK
PzKw V TANK (PANTHER)
*PzKw VI TANK (TIGER)
76-MM. OR 75-MM. SP GUN (ON PzKw 38 TANK CHASSIS)
75-MM. SP GUN (ON PzKw III TANK CHASSIS)

## ITALIAN VEHICLES

4-WHEELED ARMORED CAR
L-3 TANK
L-6 TANK
M-14 TANK
75-MM. SP GUN (ON M-14 TANK CHASSIS)

## JAPANESE VEHICLES

LIGHT ARMORED CAR, 2597 (ACTUALLY A VERY SMALL TANK)
LIGHT TANK, 2595
MEDIUM TANK, 2597

# NEWS & MISCELLANY

## NEWS

Judy, type 2 carrier-based reconnaissance plane, built by Aichi was examined at Rekata Bay. It has 12-cylinder inverted-V inline engine.

## LETTERS

### Bismarck Spotter

In your December 1943 issue there is an article on British Fleet Carriers which contains this statement: "It was planes from the *Victorious* which located the *Bismarck* and planes from the *Illustrious* which stopped her."

The actual facts on the spotting of the *Bismarck* are these: she was located by Ensign (now Lieutenant) L. B. Smith, an American Naval flier in command of a British patrol plane. On May 26, 1941, before America entered the war, Smith was serving aboard a PBY as a volunteer observer with 209 Squadron of the R.A.F. Although technically a non-participant, Smith was in fact Patrol Plane Commander because of his experience with Catalinas. After seven hours' search, Smith and his copilot, Flying Officer Briggs, spotted the *Prinz Eugen* and Briggs left his post to prepare a contact report. Smith started to climb for cloud protection when he was taken under fire by the *Bismarck*. The plane suffered many shrapnel hits but continued to track the *Bismarck* for four hours. Two other planes continued the tracking after fuel considerations forced Smith to return to base.

G. T. MUNDORFF Jr.,
Commander, U. S. N.

●

### Permission Granted

The silhouettes of naval vessels on pages 26 and 27 of the September 1943 issue of the *U. S. Army-Navy Journal of Recognition* are excellent training aids.

It is hereby requested that reproduction of these two pages be authorized.

Lt. Col. A. H. Parker,
Headquarters Harbor Defenses of New York,
Fort Hancock, N. J.

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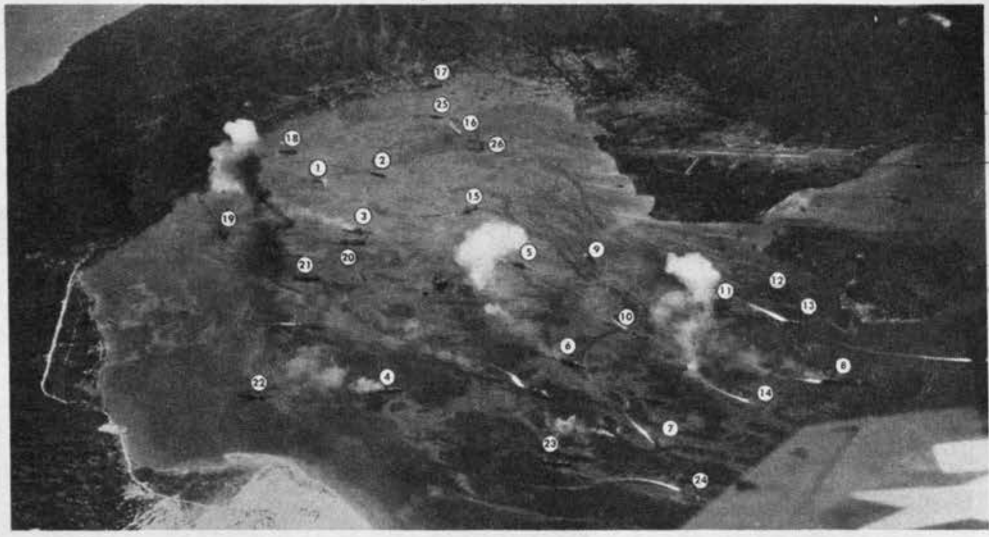

JAPANESE SHIPS IN RABAUL HARBOR PHOTOGRAPH

WARSHIPS
1 SENDAI CLASS CL
2 NATORI CLASS CL
3 ATAGO CLASS CA
4 TONE CLASS CA
5 ATAGO CLASS CA ATAGO-TAKAO GROUP
6 ATAGO CLASS CA ATAGO-TAKAO GROUP
7 TERUTSUKI CLASS DD
8 MOGAMI CLASS CA
9 DD
10 DD
11 DD
12 DD
13 DD
14 DD

MERCHANT SHIPS
15 MODERN COMBINATION CARGO VESSEL 8,000 G.T.
16 HOSPITAL SHIP (PAINTED WHITE) 6,000 G.T.
17 CARGO VESSEL 6,000 G.T.
18 CARGO VESSEL 6,000 G.T.
19 PASSENGER SHIP (KEIHUKU MARU CLASS) 3,500 G.T.
20 MODERN TANKER, 10,000 G.T.
21-26 INCL.—SMALL CARGO VESSELS 3,000 G.T.

### Double-Header

In the October issue of *U. S. Army-Navy Journal of Recognition* on page 32 is shown a picture of the *Kumano*, Mogami Class of Japanese heavy cruiser. The caption states, "Three triple 8-in. turrets forward and two aft give the cruiser heavy firepower." Does this information supersede the data found in ONI 41–42 and ONI 222 regarding this Class which states, "10—8 in. 50-cal. twin turrets"?

(see name, letter below)

The picture on page 32 is one of the Mogami Class taken prior to re-arming. Triples are now replaced by twins as shown in ONI 41–42.

In the article "Bumps" in the November issue of the *Journal*, the picture shown at the top of page 23 appears to be the Mauritius Class of British light cruisers, rather than the London Class of British heavy cruisers as shown. May I refer you to page 32 of Jane's Fighting Ships of 1942.

Sgt. John L. Parcels,
Recognition Department,
Ground School, AAFPS (ATE),
Moody Field, Ga.

By referring to the center spread of the December issue of the *Journal* and to the generalized silhouettes of the United Kingdom naval vessels in the Recognition Pictorial Manual of Naval Vessels (FM 30–50, Navaer, 00–80V–57), it is evident that the "Bump" representation noted in the above letter is actually the London of Devonshire Class. The Mauritius, which is one of the six units of the Fiji Class of light cruisers, is very similar to the London.

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11—Bot., Dmitri Kessel
15—Rt. cen., J. R. Eyerman
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43—Top rt., Acme
44—Top, Int.; lt. bot., Acme

## QUIZ ANSWERS

### QUIZ No. 1

1 SBD's (Ships—Old Porter Mahan (2)
2 Dave
3 Kate
4 Val
5 Lily
6 F4F
7 Beaufighter
8 Hurricane
9 F6F
10 SB2C
11 Nell
12 Tony
13 B-25

### QUIZ No. 2

| Plane: | Range | In or Out of Range |
|---|---|---|
| 1 Ju-88 | 300 ft. | In |
| 2 A-20 | 1500 ft. | Out |
| 3 Rufe | 250 ft. | In |
| 4 Me-110 | 1000 ft. | In |
| 5 Zeke | 1000 ft. | In |
| 6 Hamp | 750 ft. | In |
| 7 Nell | 1200 ft. | Out |
| 8 Fw-200K | 800 ft. | In |
| 9 Sally | 1500 ft. | Out |
| 10 Oscar Mk I | 500 ft. | In |
| 11 Betty | 2250 ft. | Out |
| 12 He-115 | 1500 ft. | Out |

Answers for pp. 38-39: P-47-2, 3, 5; FW-190—1, 4, 6.

### QUIZ No. 3

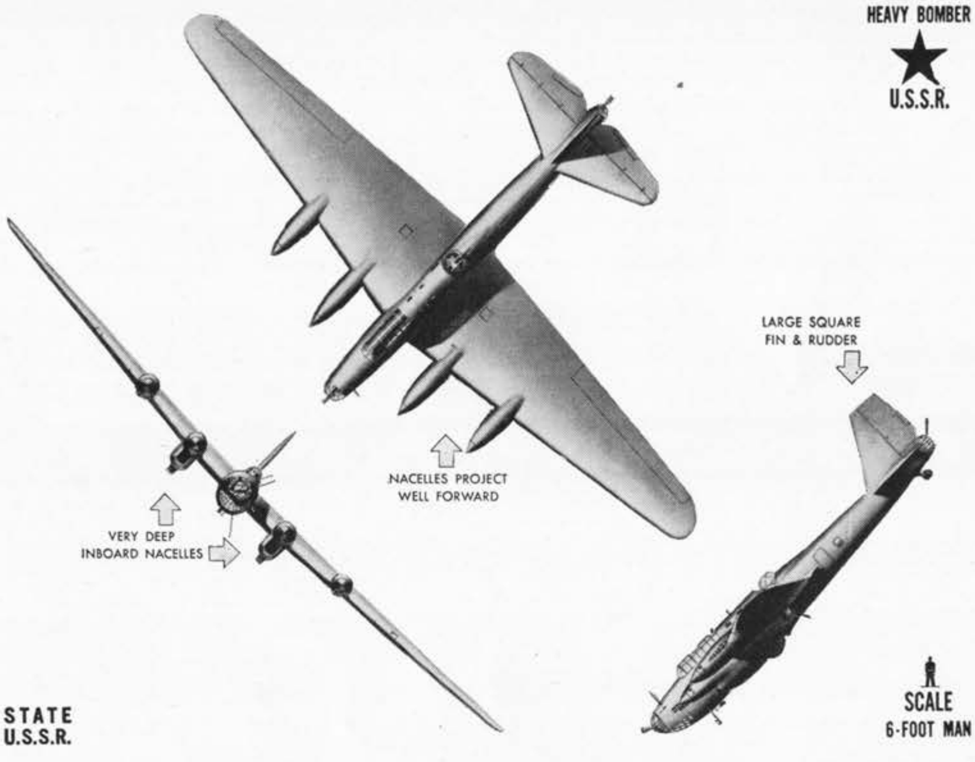
1 U.S. DD Benson-Livermore Class
2 U.S. DD Gridley Class
U.S. CA Northampton Class
3 U.S. CA Cleveland Class
U.S. CV Saratoga
U.S. CA Cleveland Class
U.S. DD Fletcher Class
4 Jap CA Atago Class
5 U.S. CL Atlanta Class
Br. CV H.M.S. Victorious
6 U.S. CL Atlanta Class
7 U.S. BB New Mexico Class
U.S. BB New Mexico Class
U.S. CA Portland
8 U.S. CV Enterprise
U.S. DD Mahan Class
9 Br. CA London Class
10 U.S. CVL Independence Class
11 Center of photo—LCI's
Right—U.S. CL Cleveland Class
Left—LCI, Br. DD

HEAVY BOMBER

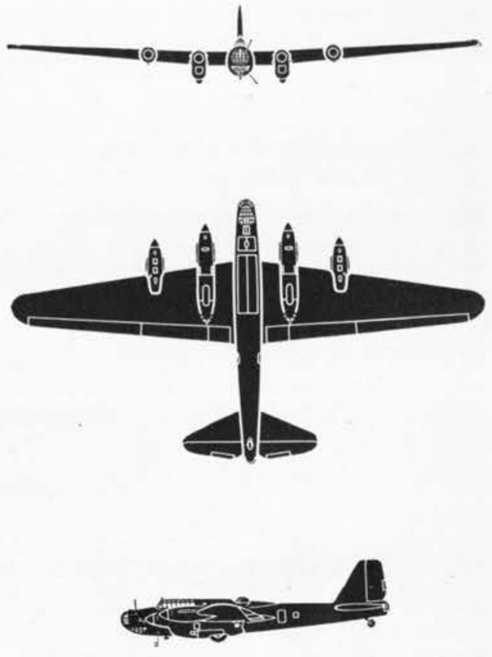
★

U.S.S.R.

# TB-7


LARGE SQUARE FIN & RUDDER
NACELLES PROJECT WELL FORWARD
VERY DEEP INBOARD NACELLES
SCALE
6-FOOT MAN

**STATE**
**U.S.S.R.**



**DISTINGUISHING FEATURES:** Four inline engine, mid-wing monoplane. Wings are tapered on both edges with rounded tips. Outboard nacelles small and round. Inboard nacelles deep with large radiator under engine and gun position in rear. Raised greenhouse with rear portion covered. Top gun turret. Tailplane tapers to round tips, while fin and rudder is tall and angular. **INTEREST:** This is the best-known Soviet long-range bomber. These planes have made effective raids on Berlin, Danzig and Balkan cities. It is now in large-scale production and is in service with the new bomber command of the Red Air Force. The TB-6B, from which the TB-7 was redesigned, was used in Soviet Polar expeditions before the war. The TB-7 carries a crew of about nine men. Gun positions in the large underslung inboard nacelles are interesting feature of this aircraft.

**SPAN:** 131 ft. 2 in. **SERVICE CEILING:** 26,000 ft.
**LENGTH:** 73 ft. 10 in.
**MAX. SPEED:** 276 m.p.h. at 21,000 ft.

DECEMBER, 1943
FROM DATA CURRENTLY AVAILABLE

WAR DEPARTMENT FM 30-30
NAVY DEPARTMENT BUAER 3

~~RESTRICTED~~

**NOTE:** This page is to be cut along dotted lines (*above* and *below*), added to the proper nation's section in the Recognition Pictorial Manual. The dots indicate perforations.

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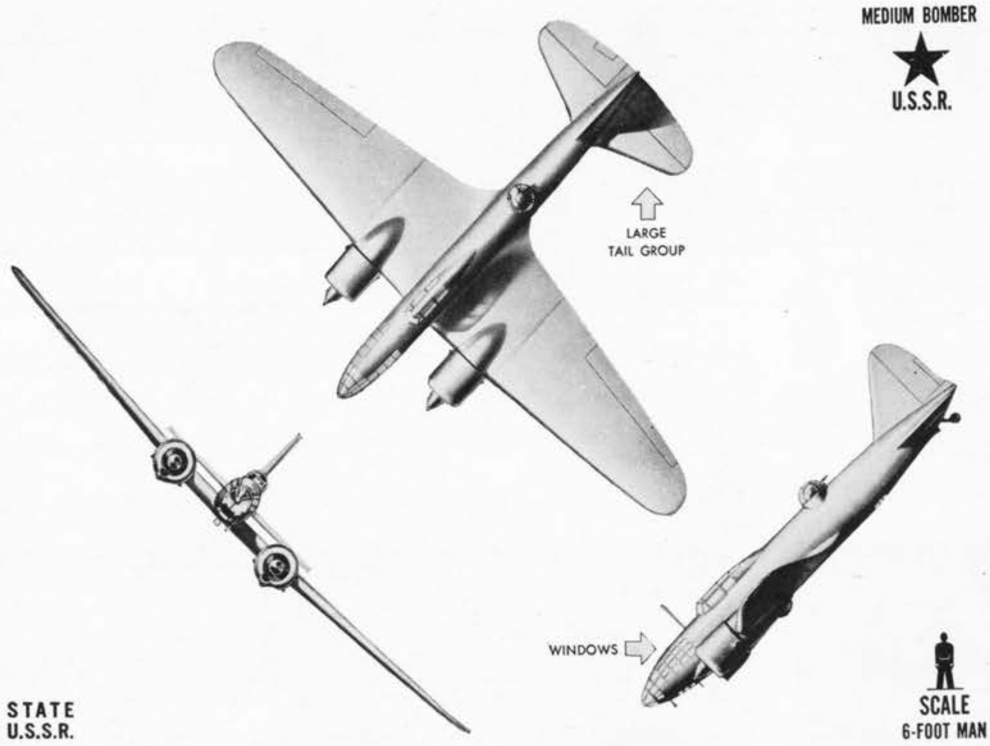
MEDIUM BOMBER

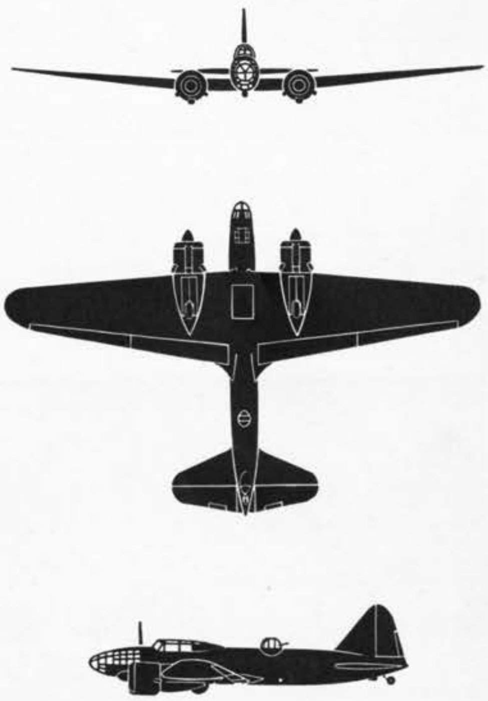
★

U.S.S.R.

# DB-3F



**STATE**
**U.S.S.R.**



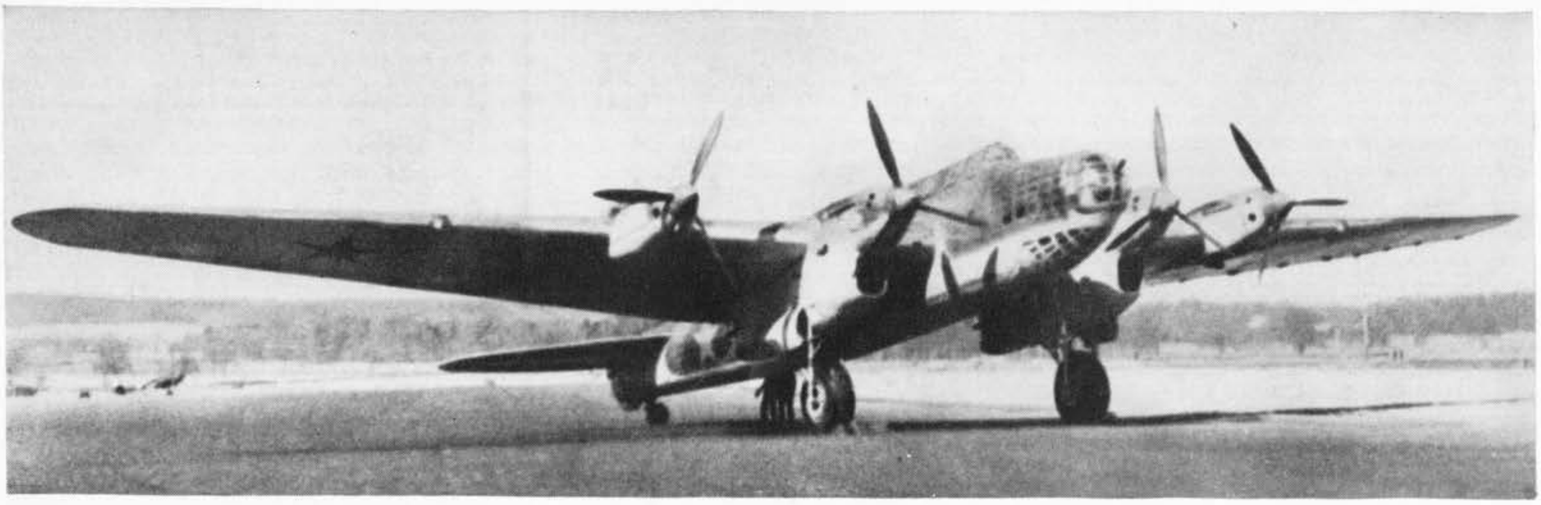
**DISTINGUISHING FEATURES:** Twin radial engine, low-wing monoplane. Trailing edge has taper and fairs into fuselage. Transparent nose. Raised cockpit canopy. Round turret centered between fin and cockpit. Fin tapers forward. Tapered tailplane with rounded tips. **INTEREST:** The DB-3 and DB-3F were developed from the ZKB-26 which flew from Moscow to Miscou Island, New Brunswick in April 1939. The DB-3F has a streamlined pointed nose instead of a turret and slightly different engine cowlings; otherwise it is identical to the DB-3. The large wing-root fillets are characteristic of most Soviet types. The M-88 radial engines give about 1,100 h.p. and are fitted with two speed superchargers. Other equipment consists of variable pitch propellers and three 7.6-mm. or 12.7-mm. free machine guns. The DB-3F is slightly faster than the DB-3 and when fitted with extra gas tanks it can be used for long range photographic reconnaissance.

**SPAN:** 70 ft. 2 in. **SERVICE CEILING:** 30,700 ft.
**LENGTH:** 47 ft. 7 in.
**APPROX. SPEED:** 300 m.p.h. at 21,000 ft.

DECEMBER, 1943
FROM DATA CURRENTLY AVAILABLE

WAR DEPARTMENT FM 30-30

[redacted]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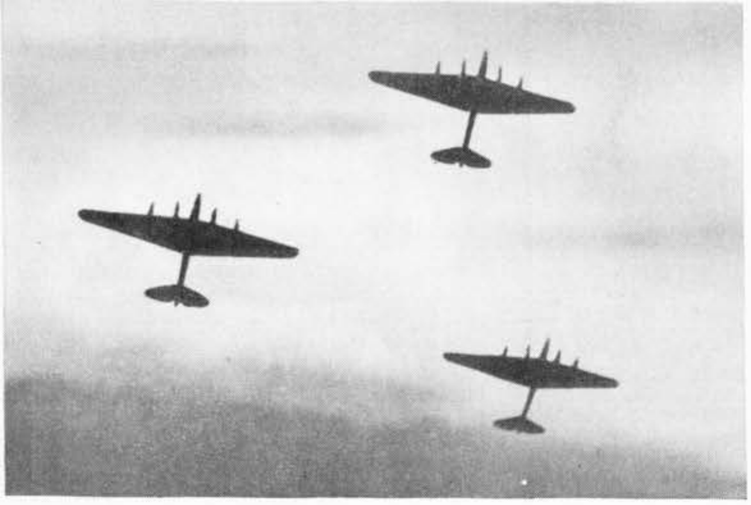
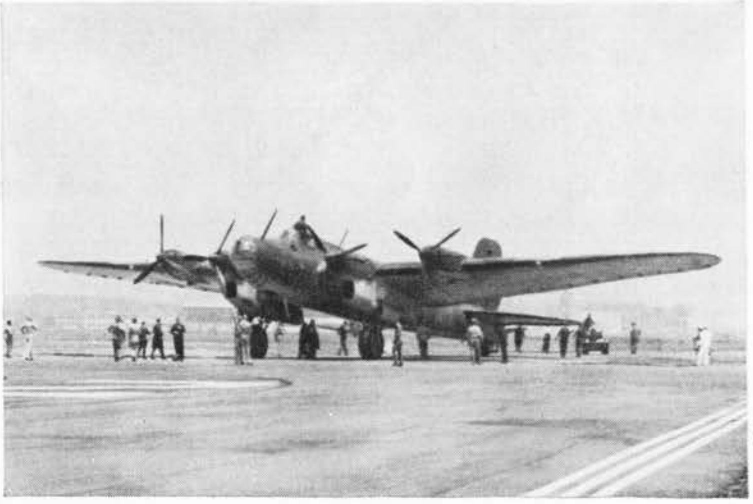
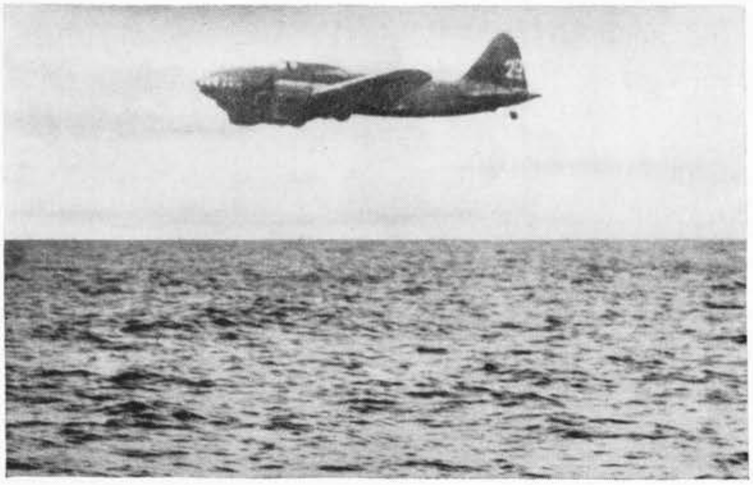

B


C

**TB-7**, standard heavy bomber of Red Air Force, has also been used as a transport for Soviet officials. With a wing span greater than that of the B-24 Liberator, the TB-7 is a big plane, fast and well armed. Carrying 2 to 4 tons of bombs, it has a range of 2,500 miles.

**DB-3F** has been compared in size and performance to the B-25 Mitchell, although recognitionally they are quite different. The first Soviet plane to bomb Berlin, the DB-3F is a long-range ship. Its 2 tons of bombs are carried partly internally and partly externally.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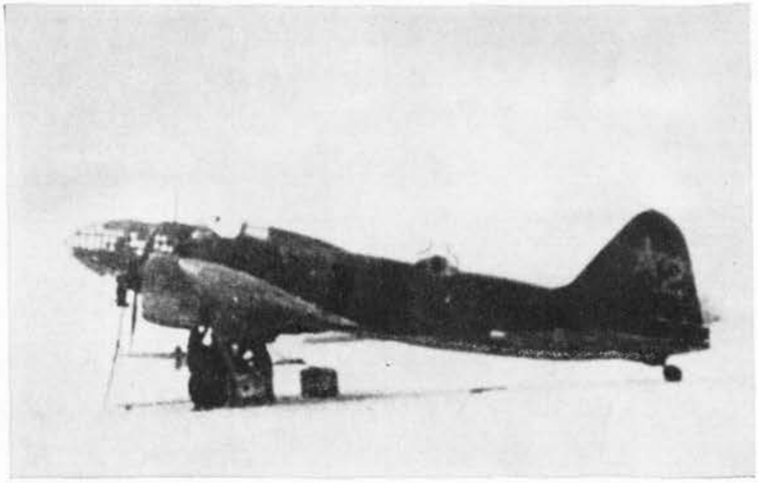
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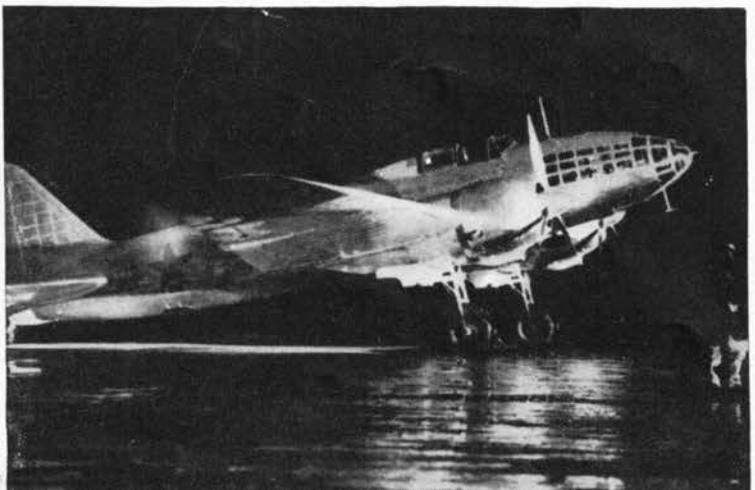
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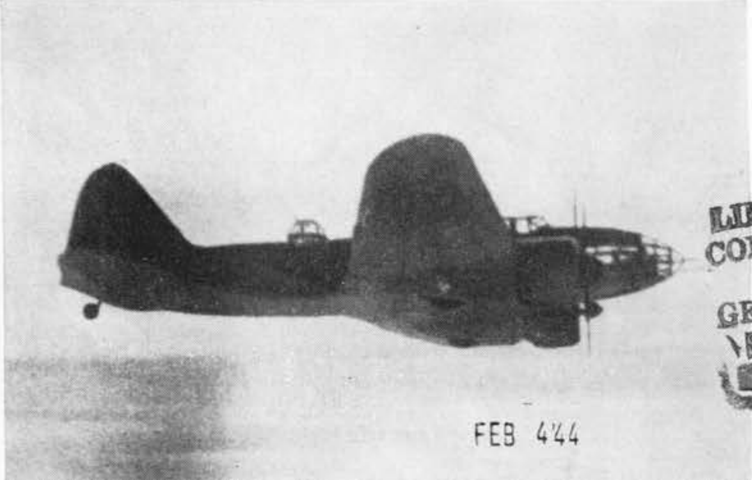
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U. S. ARMY-NAVY JOURNAL OF

# RECOGNITION

PACIFIC BEACHHEAD

FEBRUARY, 1944
NUMBER 6

~~RESTRICTED~~

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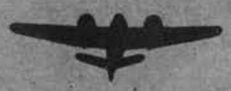
# QUIZ NO. 1: THESE ARE SILLOGRAPHS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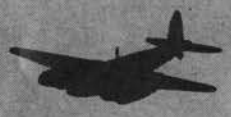
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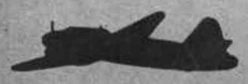
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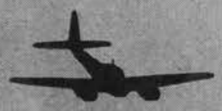
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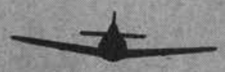
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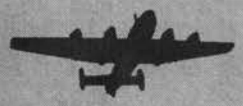
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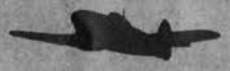
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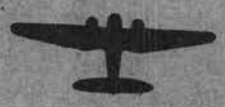
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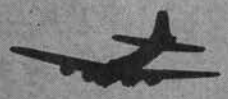
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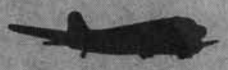
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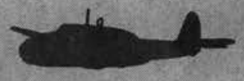
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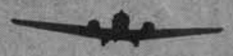
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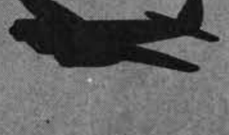
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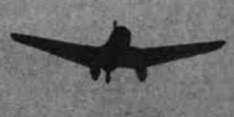
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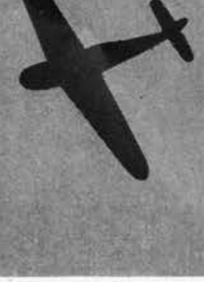
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For answers, see p. 50

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RECOGNITION

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# TRAINING AIDS

Since it got underway in September 1943, the *Journal* has tried to present the latest information and best available pictures on various forms of operationally important matériel, both friendly and enemy. With this article, the *Journal* is venturing into a new field—the methods and devices for presenting recognition instruction.

Many synthetic methods of duplicating actual visual conditions have been devised. In most distant views of aircraft, for example, the interesting details of construction disappear and the plane appears to the eye as a dark gray silhouette. The sillographs on the facing page are an attempt to reproduce this condition in print. The detail has been removed; engine nacelles, turrets, and other features are seen only in relief against the gray sky. Since the images are made from flying photographs, they are presented in the same attitudes as they would be to the eye. And they give a large image for printing or magic-lantern projection.

But sillographs have one major weakness. Like all pictures, they are static. The actual spotting of airplanes consists of recognizing a moving, constantly altering shape.

Better than the sillograph, is the shadowgraph presented on the following two pages. This is an excellent recognition training aid. It is simple to construct, easy to operate. The aircraft can be presented realistically and in motion; contrasts and comparisons may be made between types. A number of people can see the screen at once and all see the same view at the same time. By superimposing a ringsight on the screen, the device can be used to teach and test range estimation. And, finally, an almost unlimited variety of views can be shown.

The shadowgraph operates on the same principle as the shadowplays frequently presented in church and school auditoriums. A light source is placed behind a translucent screen (a taut bed sheet or tracing paper will do), and a scale model of the airplane is introduced between the light and screen. The light should be small and concentrated and should be at least eight feet from the screen. The audience should be about the same distance on the other side of the screen. For a sharp silhouette and to reduce distortion, the model should be as close to the screen as possible.

In using the shadowgraph it is important to remember that the model has the same relation to the light as the shadow has to the audience. Thus, when the model is held with its nose pointed at the light, the shadow is the silhouette of the airplane as it would look coming at the viewer. If the light shines on the bottom of the model, the shadow is that of an aircraft seen from below. If it shines on top, the plane is seen from above, irrespective of where the students are sitting.

After the plane is shown from several angles, as a form of review the model can be moved to simulate flight. For an approach view, the model should be brought down on to the screen in a head-on view. Then, by gradually tilting the nose and moving the model upwards and towards the light, the effect of a plane approaching and passing overhead may be reproduced. By lowering the nose the plane can be made to appear to pass beneath the observer. Reversing these conditions, the plane can be made to fly away from the student. From a side view, the plane can be made to bank and sweep across the field of view in varied maneuvers.

## Perspective distorts plane shape

One of the most disturbing factors in recognition which the shadowgraph can do much to clear up, is the illusion created by perspective and dihedral. Take for example the Army's chief transport, the C-47. This plane has a wing with marked dihedral, a very pronounced taper on the leading edge, a straight trailing edge. In plan view, this wing is one of the chief recognition points for the airplane. However, when the C-47 is seen from below coming at you, perspective causes the wing to appear swept forward; the leading edge seems almost straight, while the taper seems to be on the trailing edge. Thus the plan form of the wing is just reversed. By using the shadowgraph, the effect of this distortion on a particular plane can be easily demonstrated. By rule, when seen from above, front or rear, a wing with marked dihedral will appear to be swept away from you; when seen from below, the wings will be bent toward you (*see diagram, lower right, page 5*).

With the shadowgraph, two or more planes may be shown at the same time so that differences between similar craft may be pointed out in identical views. This is a great advantage when considering planes which have had limited photographic coverage. Not only can identical views be shown, but models built to the same scale (usually 1:72) can be used and their size compared exactly.

On next two pages the *Journal* presents photographs of the shadowgraph set-up at the AAF Air Intelligence School at Harrisburg, Pa., and schematic diagrams showing the arrangement and use of a typical shadowgraph.

**LIGHT SOURCE FOR SHADOWGRAPH** used at Harrisburg school is demonstrated by an instructor on the school staff. Baffle plates held by the instructor allow heat to escape from lamp, control the flow of light.

**SCALE MODEL OF C-47,** 1:72 true size, is held on wand formed of ten-gauge wire. Sharp point of wire fits in hole in model. The instructor can remain hidden behind framework of screen, move model about to simulate flight conditions.

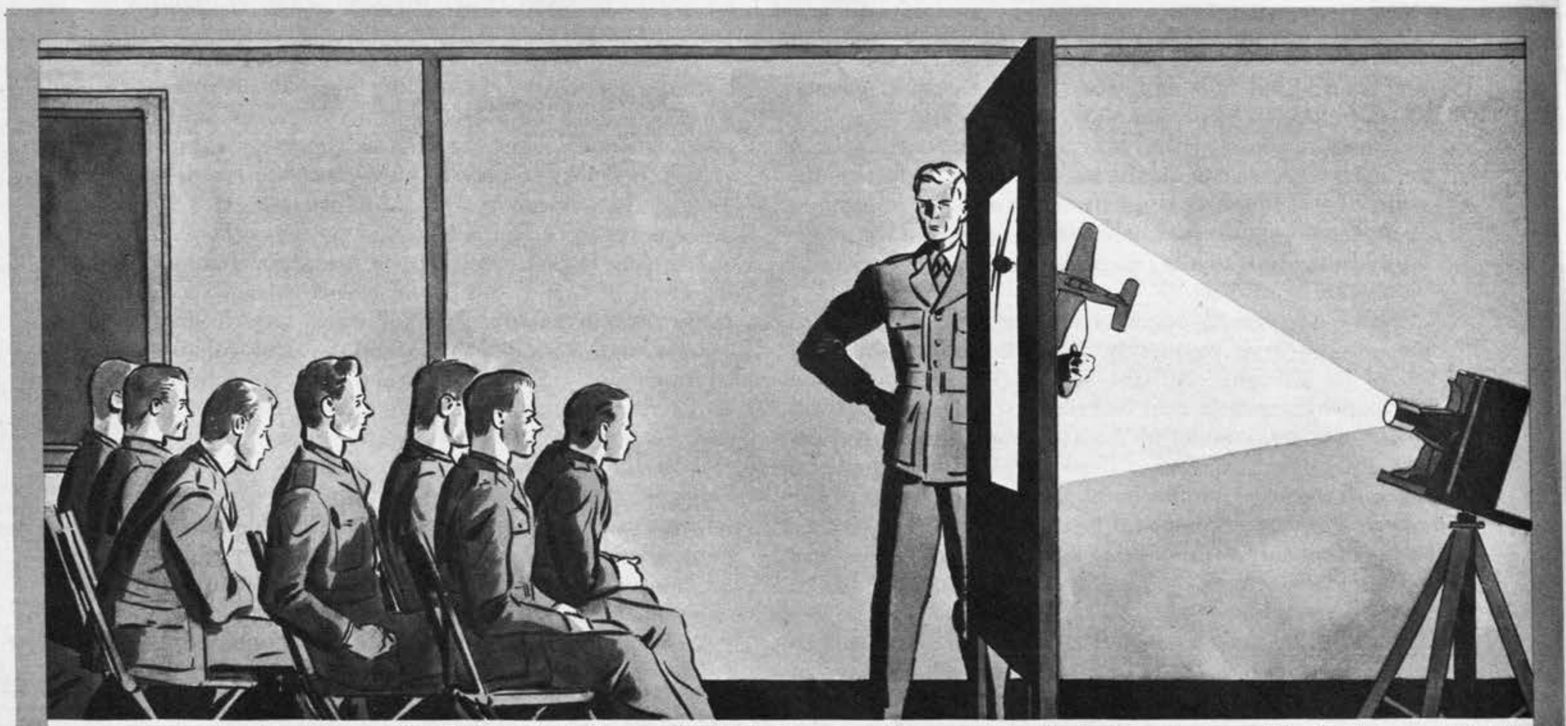
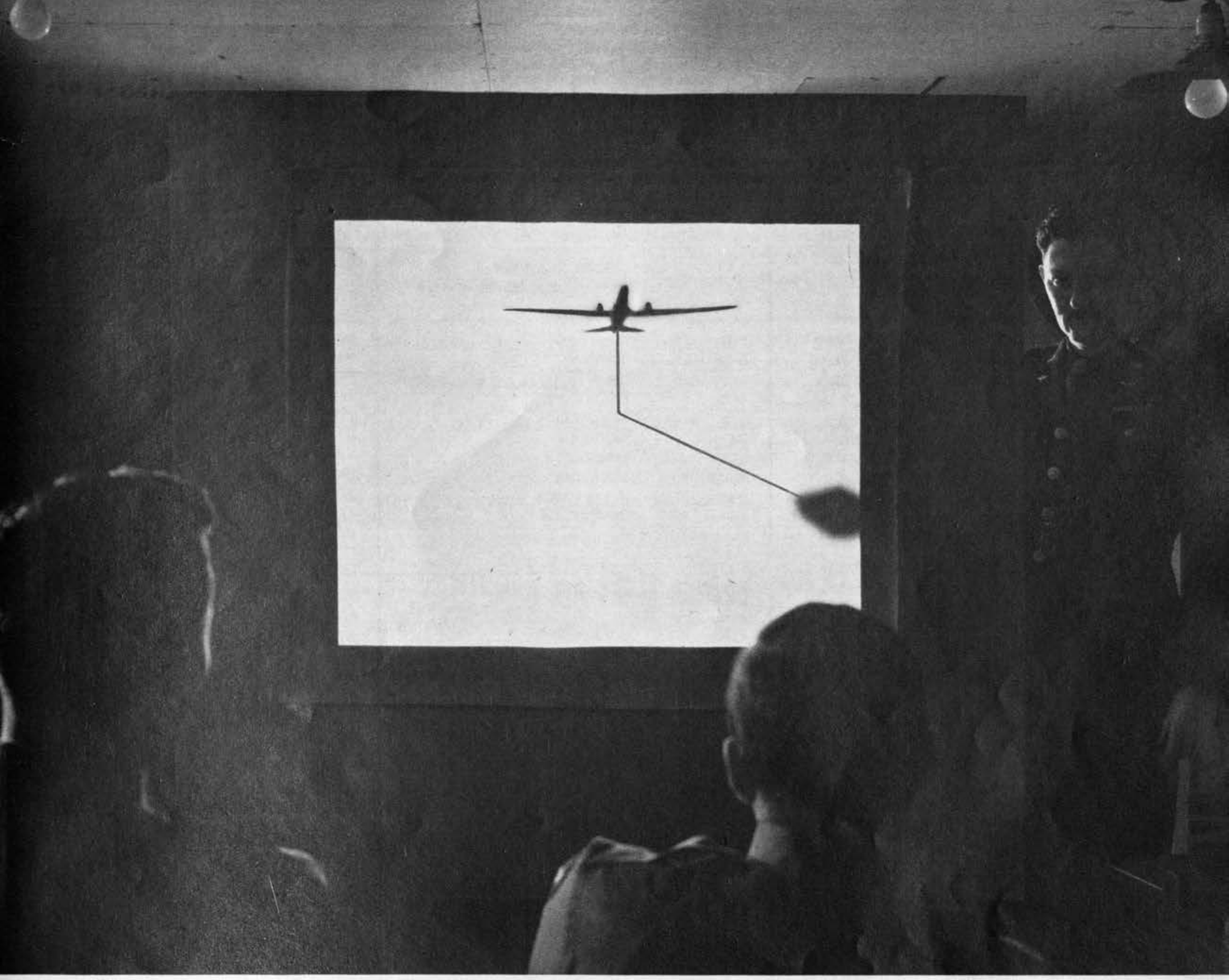
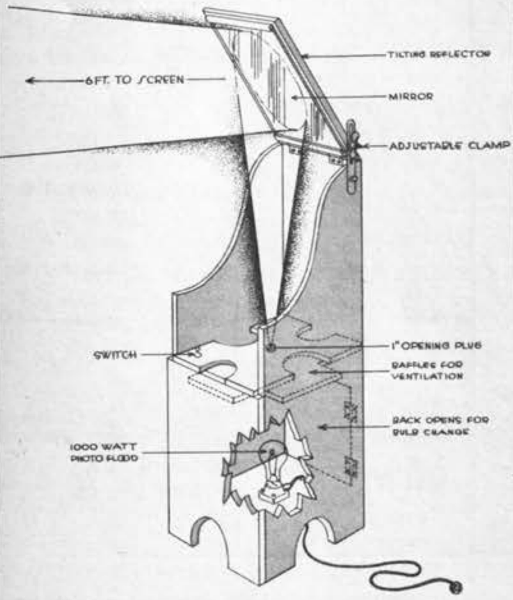


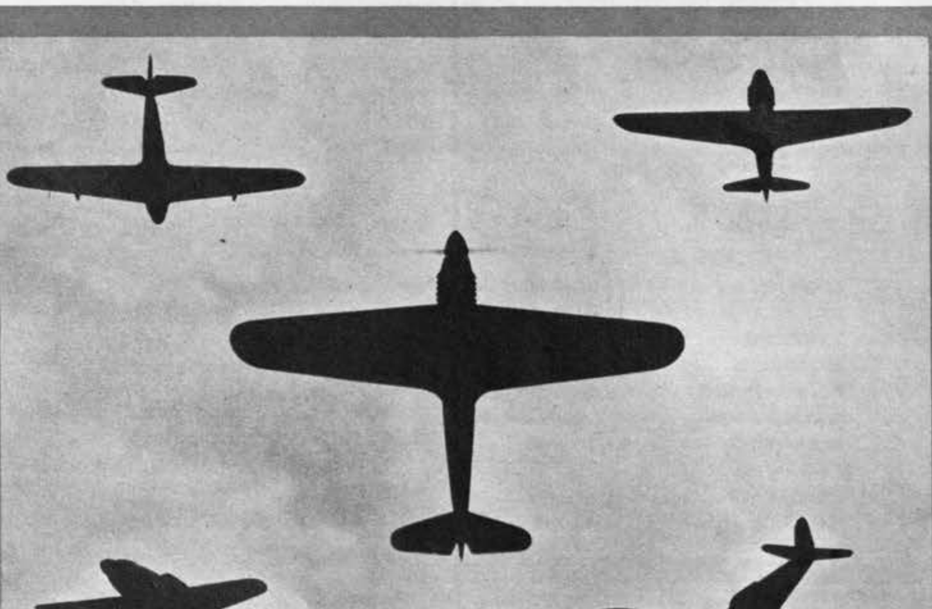
**IMAGE APPEARS** on the screen as the instructor holds model behind it. Plane appears to be coming toward audience if model is pointed at light source. As the instructor moves the plane toward light, it appears to fly over heads of onlookers, disappear. Wooden framework holding screen prevents audience from seeing which model is selected. Student seated about 30 ft. from screen sees plane at about 700 yd. range.



**TYPICAL CLASSROOM ARRANGEMENT** for shadowgraph instruction is shown in the picture above. Translucent screen is set up approximately 8 ft. from the source of light, in this case a standard slide projector such as is available for field use. Instructor holds model on thin wire wand very close to screen. The students sit in half dusk of semi-darkened room. For best results they should not be closer to the screen than the source of light.


TILTING REFLECTOR
6 FT. TO SCREEN
MIRROR
ADJUSTABLE CLAMP
1" OPENING PLUG
SWITCH
BAFFLES FOR VENTILATION
BACK OPENS FOR BULB CHANGE
1000 WATT PHOTO FLOOD

**SPECIAL SHADOWGRAPH LAMP** may be constructed to plan shown in sketch. Light is concentrated by small opening, reflected to screen by mirror.



**DISTORTION** of plane shape by perspective is shown by five views above. Central plan view shows true shape of wing. Upper views show how wing appears to be pulled toward observer when seen from below; lower views how it is pushed away when seen from above.

# AIRCRAFT RECOGNITION TRAINING LIST ~~RESTRICTED~~

THESE LISTS ARE DESIGNED MERELY TO GUIDE RECOGNITION TRAINING IN AIRCRAFT AND ARE NOT TO BE CONSTRUED AS SUPERSEDING ANY PREVIOUSLY ISSUED DIRECTIVE. CLASS A COMPRISES AIRCRAFT THAT ARE OPERATIONALLY MOST IMPORTANT. CLASS B COMPRISES AIRCRAFT THAT ARE OPERATIONALLY IMPORTANT IN SOME AREAS AND/OR ARE NUMERICALLY LESS IMPORTANT THAN CLASS A, AND ALSO AIRCRAFT WHICH, THOUGH NUMERICALLY IMPORTANT, ARE BEING GRADUALLY REPLACED. EMPHASIS SHOULD BE PLACED ON AIRPLANES IN CLASS A.

## U. S. NAVY

### CLASS A

| DESIGNATION | COMMON NAME | TYPE |
|---|---|---|
| F4F | WILDCAT | 1E-SSF |
| F6F | HELLCAT | 1E-SSF |
| F4U | CORSAIR | 1E-SSF |
| OS2U | KINGFISHER | 1E-S/O |
| SBD | DAUNTLESS | 1E-S/B |
| SB2C | HELLDIVER | 1E-S/B |
| TBF | AVENGER | 1E-T/B |
| PBY-5 & 5A | CATALINA | 2E-P/B |
| PV | VENTURA | 2E-P/B |
| PBM-3C | MARINER | 2E-P/B |

### CLASS B

| DESIGNATION | COMMON NAME | TYPE |
|---|---|---|
| SO3C | SEAGULL | 1E-S/O |
| SOC | | 1E-S/O |
| SNJ | TEXAN | 1E-S/N |
| J2F | DUCK | 1E-J |
| PB2Y | CORONADO | 4E-P/B |

## U. S. ARMY

### CLASS A

| DESIGNATION | COMMON NAME | TYPE |
|---|---|---|
| P-38 | LIGHTNING | 2E-SSF, R |
| P-39 | AIRACOBRA | 1E-SSF |
| P-40 | WARHAWK | 1E-SSF |
| P-47 | THUNDERBOLT | 1E-SSF |
| P-51 | MUSTANG | 1E-SSF |
| A-20 | HAVOC | 2E-LB, 2SF |
| B-17 | FORTRESS | 4E-HB |
| B-24 | LIBERATOR | 4E-HB |
| B-25 | MITCHELL | 2E-MB |
| B-26 | MARAUDER | 2E-MB |
| C-46 | COMMANDO | 2E-C |
| C-47 | SKYTRAIN | 2E-C |
| C-54 | SKYMASTER | 4E-C |

### CLASS B

| DESIGNATION | COMMON NAME | TYPE |
|---|---|---|
| C-60 | LODESTAR | 2E-C |
| A-29 | HUDSON | 2E-LB |
| A-30 | BALTIMORE | 2E-LB |
| A-31 (A-35) | VENGEANCE | 1E-DB |
| L-4* | PIPER GRASSHOPPER | 1E-L |
| L-5* | SENTINEL | 1E-L |

*NOTE: THESE TWO AIRCRAFT ARE REPRESENTATIVE OF THE L-TYPE.

## BRITISH—R. A. F.

### CLASS A

| COMMON NAME | TYPE |
|---|---|
| SPITFIRE | 1E-SSF |
| HURRICANE | 1E-SSF |
| TYPHOON | 1E-SSF |
| MOSQUITO | 2E-2SF, LB |
| BEAUFIGHTER | 2E-2SF |
| WELLINGTON | 2E-MB, T/B |
| BLENHEIM | 2E-MB |
| BEAUFORT | 2E-T/B, R |
| LANCASTER | 4E-HB |
| HALIFAX | 4E-HB |
| STIRLING | 4E-HB |
| SUNDERLAND | 4E-P/B |

### CLASS B

| COMMON NAME | TYPE |
|---|---|
| WHITLEY | 2E-MB |
| HAMPDEN | 2E-MB, T/B |
| WHIRLWIND (WELKIN) | 2E-SSF |
| MASTER | 1E-N |

### AMERICAN AIRCRAFT USED BY R. A. F.

| DESIGNATION | COMMON NAME | TYPE |
|---|---|---|
| P-51 | MUSTANG | |
| A-20 | BOSTON | |
| A-29 | HUDSON | |
| A-30 | BALTIMORE | |
| B-25 | MITCHELL | |
| PV | VENTURA | |
| B-24 | LIBERATOR | |
| PBY-5 | CATALINA | |
| P-40 | KITTYHAWK | |
| A-31 | VENGEANCE | |

## BRITISH FLEET AIR ARM

### CLASS A

| COMMON NAME | TYPE |
|---|---|
| SWORDFISH | 1E-T/B, R |
| BARRACUDA | 1E-T/B |

### CLASS B

| COMMON NAME | TYPE |
|---|---|
| FULMAR | 1E-SSF |
| ALBACORE | 1E-T/B, R |
| WALRUS | 1E-R |

### OTHER AIRCRAFT USED BY FLEET AIR ARM (ON U. S. AND R. A. F. LISTS)

| | | |
|---|---|---|
| | SEAFIRE | 1E-SSF |
| | SEA HURRICANE | 1E-SSF |
| F4F | WILDCAT | 1E-SSF |
| TBF | AVENGER | 1E-T/B |
| F6F | HELLCAT | 1E-SSF |
| F4U | CORSAIR | 1E-SSF |

## RUSSIAN

### CLASS A

| | | |
|---|---|---|
| LA-5 | | 1E-SSF |
| LAGG 3 | | 1E-SSF |
| IL-2 & IL-3 | STORMOVIK | 1E-LB |
| PE-2 | | 2E-DB |
| SB-3 | | 2E-MB |
| PE-2B (PE-3) | | 2E-LB |
| DB-3F (IL-4) | | 2E-MB, T/B |
| TB-7 | | 4E-HB |
| YAK-4 (BB-22) | | 2E-LB, R |

### CLASS B

| | |
|---|---|
| YAK-1 (I-26) | 1E-SSF |
| MIG-3 (I-18) | 1E-SSF |
| I-16 | 1E-SSF |
| SU-2 | 1E-LB, R |
| ER-2 | 2E-MB |
| AR-2 (improved SB) | 2E-DB |
| DB-3 | 2E-MB, T/B |

### AMERICAN AIRCRAFT USED BY RUSSIANS (ON U. S. ARMY AND NAVY LISTS)

| | | |
|---|---|---|
| P-39 | AIRACOBRA | 1E-SSF |
| P-40 | WARHAWK | 1E-SSF |
| A-20 | HAVOC | 2E-LB |
| B-25 | MITCHELL | 2E-MB |
| PBY (GST) | CATALINA | 2E-P/B |
| C-47 (PS-84) | SKYTRAIN | 2E-C |

## GERMAN

### CLASS A

| DESIGNATION | COMMON NAME | TYPE |
|---|---|---|
| ME-109 F & G | | 1E-B, SSF |
| ME-110 F & G | | 2E-B, 2SF |
| ME-410* | | 2E-B, 2SF |
| FW-190A | | 1E-B, SSF |
| JU-87D | STUKA | 1E-DB |
| JU-88A, C & S | | 2E-MB, DB |
| HE-111H | | 2E-MB, T/B |
| JU-188 | | 2E-MB, DB |
| DO-217E, K & M** | | 2E-MB, DB |
| HE-177 | | 2E-HB, R |
| JU-52 | | 3E-C, GT |
| JU-290 | | 4E-C, HB, R |
| ME-323 | | 6E-C |

### CLASS B

| DESIGNATION | COMMON NAME | TYPE |
|---|---|---|
| ME-210* | | 2E-B, 2SF |
| AR-196 | | 1E-R, FP |
| BV-138 | | 3E-P/B |
| BV-222 | | 6E-P/B |
| HS-129 | | 2E-LB, GA |
| HE-115 | | 2E-R, FP, T/B |
| FW-189 | | 2E-LB, R |
| HS-126 | | 1E-R |
| FI-156 | | 1E-L |
| JU-90 | | 4E-C |
| JU-86P | | 2E-LB, R |
| FW-200C | KURIER | 4E-HB |
| DFS-230 | | G |
| GO-242 & GO-244 | | G and 2E-C |

*NOTE: RECOGNITIONALLY THE SAME.

**NOTE: DIFFERENCES IN THESE MODELS SHOULD BE NOTED IN INSTRUCTION.

## JAPANESE

### CLASS A

| | | |
|---|---|---|
| T-3 | TONY | 1E-SSF |
| T-2 | TOJO | 1E-SSF |
| T-2 | NICK | 2E-2SF |
| T-1, MARK 1, 2 | OSCAR | 1E-SSF |
| T-0, MARK 1, 2* | ZEKE | 1E-SSF |
| T-0, MARK 2 | HAMP | 1E-SSF |
| T-0 or T-2 | RUFE | 1E-SSF, FP |
| T-0 | PETE | 1E-R, FP |
| T-0 | JAKE | 1E-FP, DB |
| T-100, MARK 1, 2 | DINAH | 2E-R |
| T-99, MARK 1, 2 | VAL | 1E-DB |
| T-97 | KATE | 1E-T/B |
| T-1 | BETTY | 2E-MB, T/B |
| T-100 | HELEN | 2E-MB |
| T-99 | LILY | 2E-LB |
| T-97, MARK 1, 2, 3 | SALLY | 2E-MB, T/B |
| T-96 | NELL | 2E-MB, T/B |
| T-2 | EMILY | 4E-P/B |
| T-97 | MAVIS | 4E-P/B |

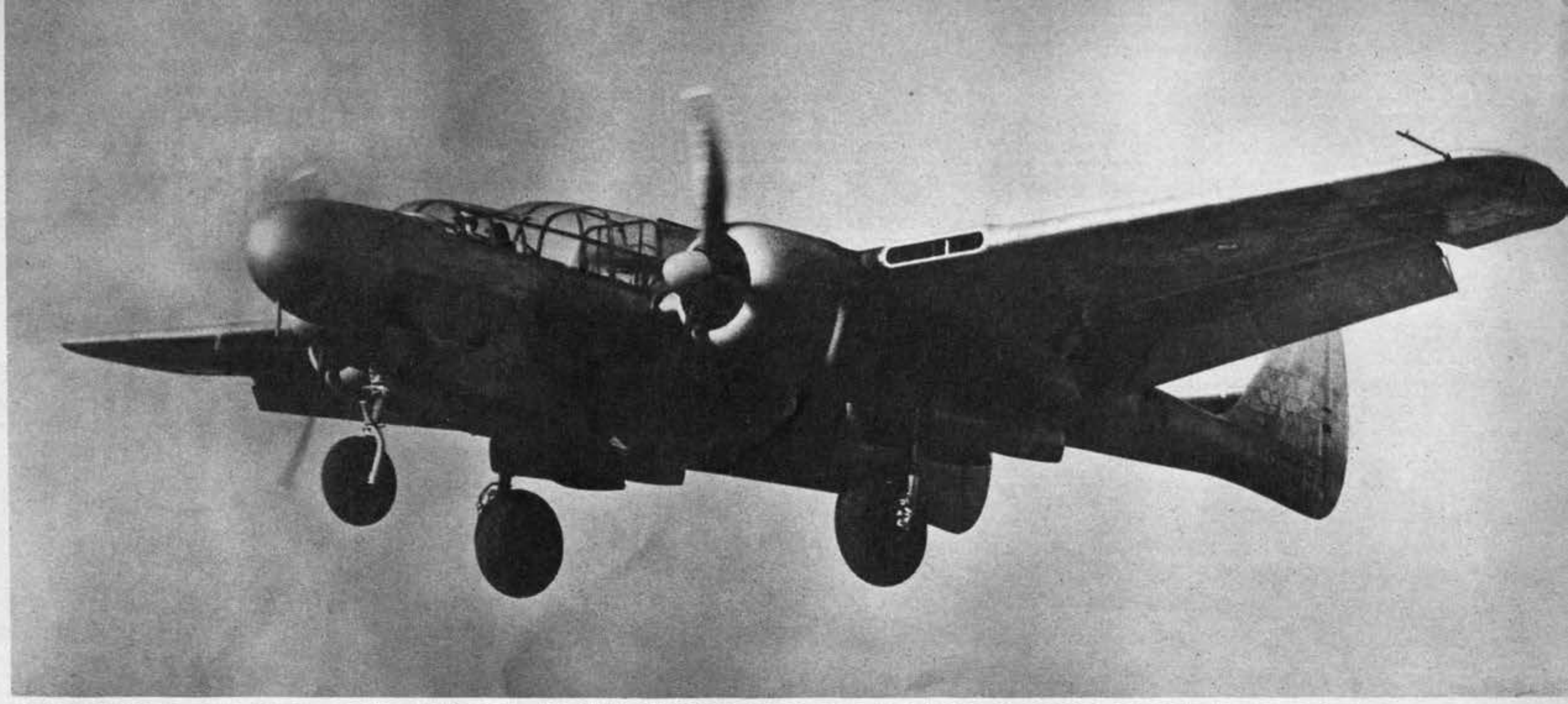
### CLASS B

| | | |
|---|---|---|
| T-97 | NATE | 1E-SSF |
| T-95 | DAVE | 1E-R, FP |
| T-99 | SONIA | 1E-R |
| T-99 | CHERRY | 2E-FB |
| T-MC-20 | TOPSY | 2E-C |
| T-DC-2 | TESS | 2E-C |
| T-LOCKHEED | THELMA | 2E-C |

*NOTE: ZEKE 2 HAS A HAMP FUSELAGE AND ENGINE WITH ZEKE WINGS, BOMB RACKS.

### ABBREVIATIONS

| | |
|---|---|
| B | BOMBER |
| C | CARGO |
| F | FIGHTER |
| G | GLIDER |
| J | UTILITY |
| L | LIAISON |
| N | TRAINER |
| R | RECONNAISSANCE |
| DB | DIVEBOMBER |
| FP | FLOATPLANE |
| GA | GROUND ATTACK |
| GT | GLIDER TUG |
| HB | HEAVY BOMBER |
| LB | LIGHT BOMBER |
| MB | MEDIUM BOMBER |
| P/B | PATROL BOMBER |
| S/B | SCOUT BOMBER |
| S/N | SCOUTING, TRAINING |
| S/O | SCOUTING OBSERVATION |
| T/B | TORPEDO BOMBER |
| SSF | SINGLE-SEAT FIGHTER |
| 2SF | TWO-SEAT FIGHTER |
| 1E | SINGLE-ENGINE |
| 2E | TWIN-ENGINE |
| 3E | THREE-ENGINE |
| 4E | FOUR-ENGINE |
| 6E | SIX-ENGINE |

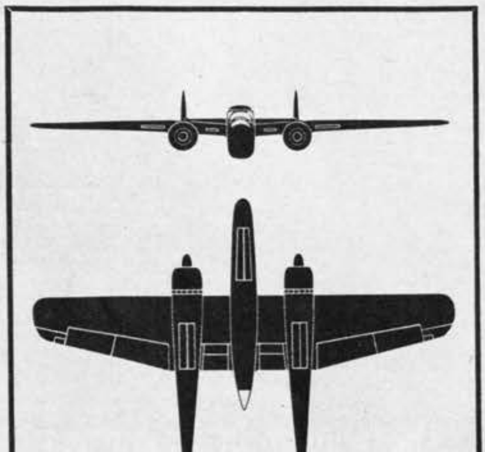


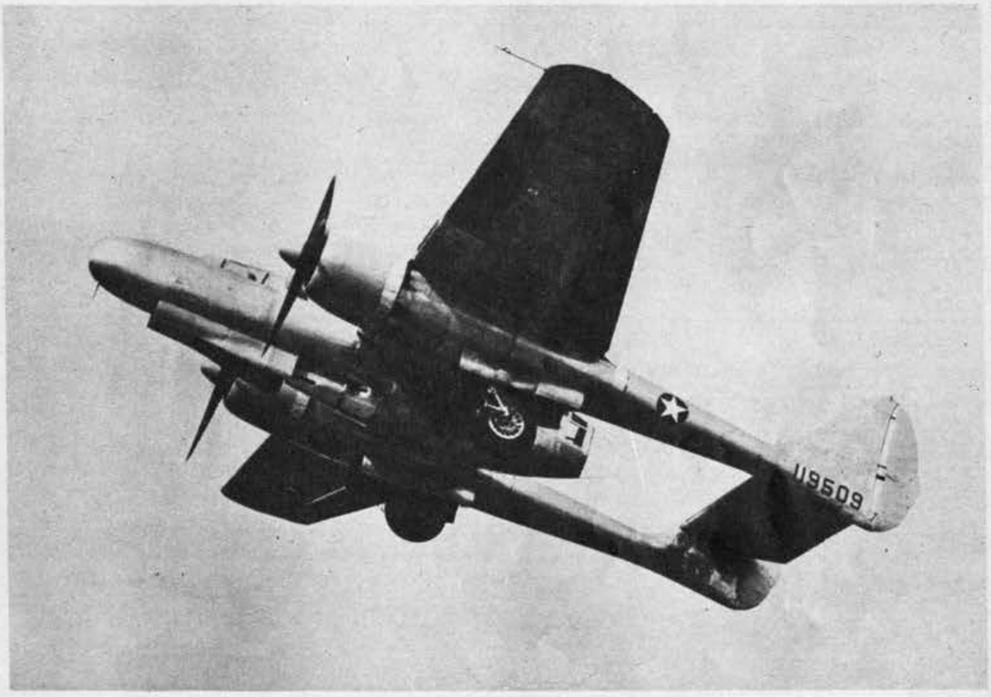
ARMY'S NEWEST PURSUIT IS TWIN-ENGINE, TWIN-BOOM JOB WITH TRICYCLE LANDING GEAR, HAS LARGE GLASSED-IN GONDOLA TO HOUSE CREW OF THREE

# USAAF'S FAST NEW PURSUIT

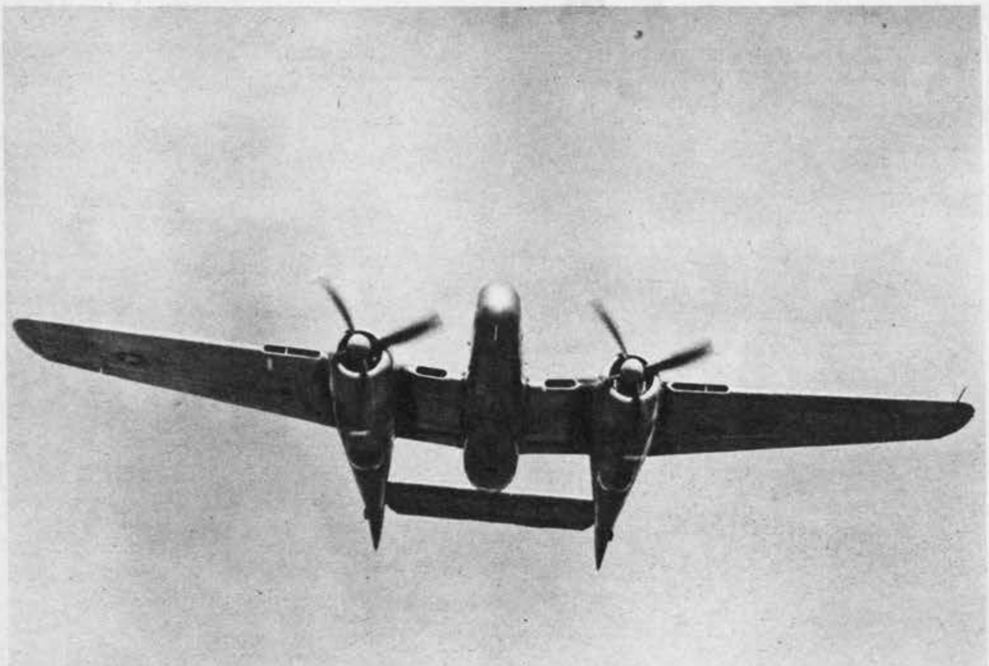
About to go into action with the Army Air Forces is the P-61, a new plane built by Northrop to serve as a night interceptor-fighter. It is in the high-speed class at medium altitudes, and has already acquired the nickname "Black Widow."

**RECOGNITION:** P-61 is a three-place, high-wing monoplane with a tailboom running aft from each fat radial-engine nacelle. Each boom is smoothly streamlined with slight bulge on under side for landing wheel. The pilot's nacelle is long nosed, is deepest opposite wing. It is pointed aft. Wing has straight leading, tapered trailing edge. Span, 66 ft.; length, 49 ft.





**WHEELS FOLD INTO BOOMS** as Black Widow takes off. Though similar to the P-38, P-61 has much larger gondola to house bigger crew. Glassed-in rear section provides good visibility for gunner.



**P-61'S WING** has slight gull effect because of dihedral on the inboard panels. Tailplane is straight with cutouts at end for rudder clearance. Lines of the tailbooms are unbroken in the plan view.

The winner in its battles over Britain, the RAF now sends its fighters winging against Reich

# ROYAL AIR FORCE

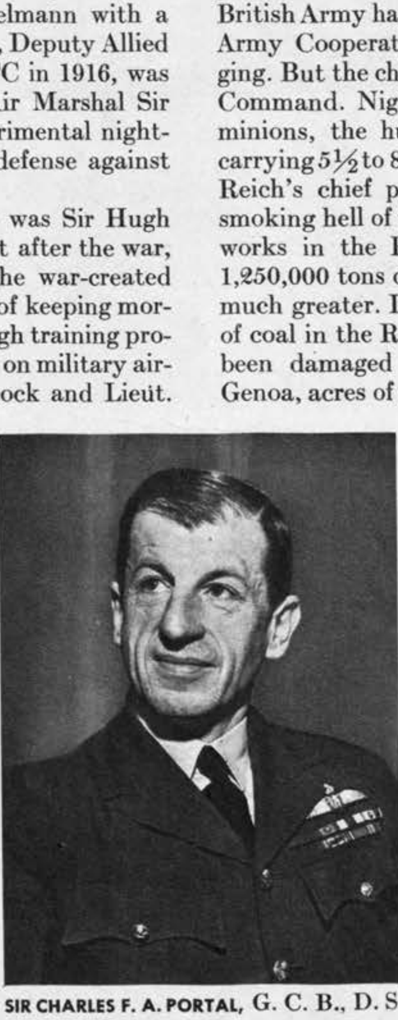
## Greatest air force of the First World War, it has reaffirmed its position in the Second

The Royal Air Force was created on April 1, 1918. Its first communique, issued a few days later, reported that No. 20 Squadron dropped sixteen 20-lb. bombs; No. 1 Squadron thirteen 25-lb. bombs; and No. 206 Squadron seventy-four 25-lb. bombs. In addition, four 40-lb. phosphorous bombs were dropped. In terms of this war's 8,000-lb. blockbusters, this may not seem like a very auspicious start, but within three months the RAF had command of the air over Europe. Against the Germans' 340 planes, Britain could rank 1,390 better machines better manned. By the end of the war, when the rout of the first Luftwaffe was complete, the RAF had 22,647 airplanes, 103 airships, 291,000 officers and men plus 25,000 women in the WRAF. In the short eight months of its wartime life, it had become the world's first great air force.

Many of the men who are leading the RAF to victory in its second great trial gained their first experience with the infant RAF and its immediate predecessors, the Royal Flying Corps and Royal Naval Air Service. Sir Charles Portal, Marshal of the RAF and Chief of Air Staff, flew as an observer in the RFC as early as 1915, once pot-shotted the German ace Immelmann with a rifle. Air Chief Marshal Sir Arthur Tedder, Deputy Allied Commander in Europe, flew with the RFC in 1916, was squadron leader in the RAF by 1919. Air Marshal Sir Arthur Harris commanded the first experimental night-flying detachment in World War I for defense against Zeppelin attacks on London.

Chief of Air Staff from the beginning was Sir Hugh Trenchard, England's Billy Mitchell. Just after the war, he had the great task of transforming the war-created RAF into a vital peacetime military arm, of keeping morale at a high pitch, of establishing a thorough training program and maintaining experimental work on military aircraft. During his tenure Capt. John Alcock and Lieut. Arthur Whitten Brown made the first transatlantic flight, the dirigible R-34 flew to America and back, and other flights were made to India and Australia. Perhaps most important of all, the series of Schneider Cup racers that culminated in the Spitfire got underway. When "Boom" Trenchard retired in 1929 with the rank of Marshal of the Royal Air Force, he remarked truthfully that he had laid the foundations for a castle but if nobody wanted to build anything bigger than a cottage on them, they would still have a jolly good cottage.

When the Second World War broke out, Trenchard's foundations stood fast. In the months of August and September 1940, when Britain's Spitfires and Hurricanes broke the legend of the Luftwaffe's invincibility, the RAF took its place among the great military organizations of all time. For the next year the war was bitter. Foiled in the daytime, the Germans took to night bombing. But after the first few thunderous assaults, the RAF came back with radar-equipped Beaufighter and Havoc nightfighters. On May 10, 1941, 33 of the raiders failed to return home.

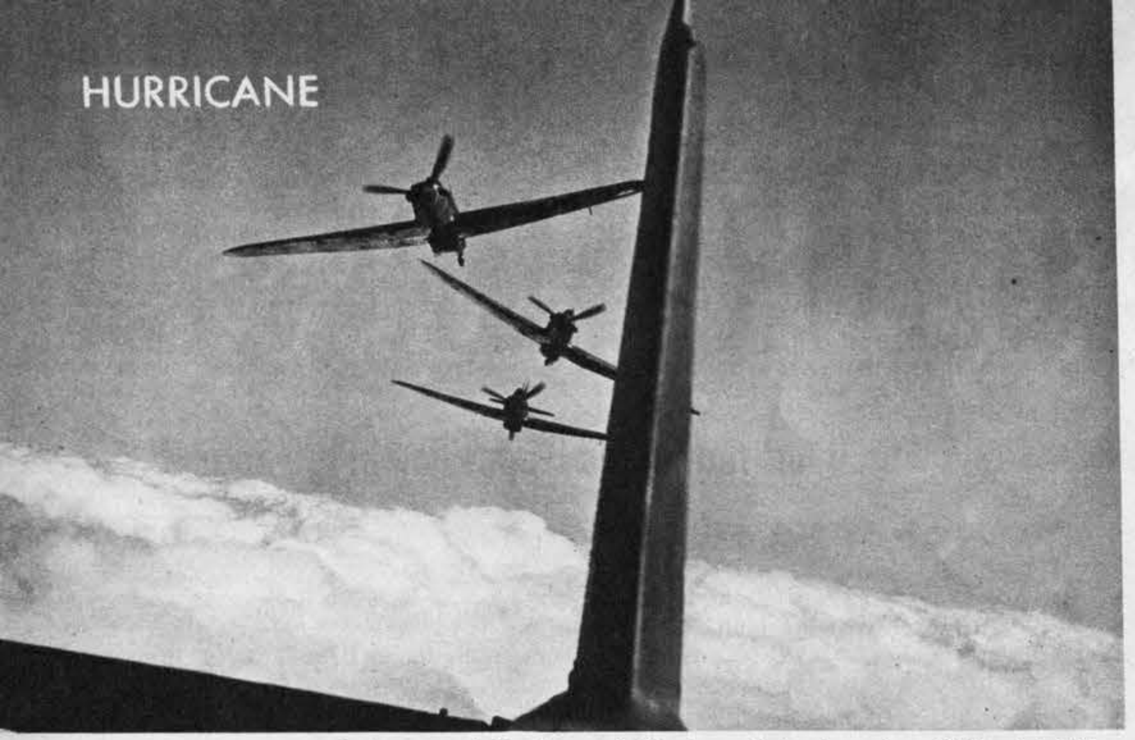


**SIR CHARLES F. A. PORTAL,** G. C. B., D. S. O., M. C., Marshal of Royal Air Force.

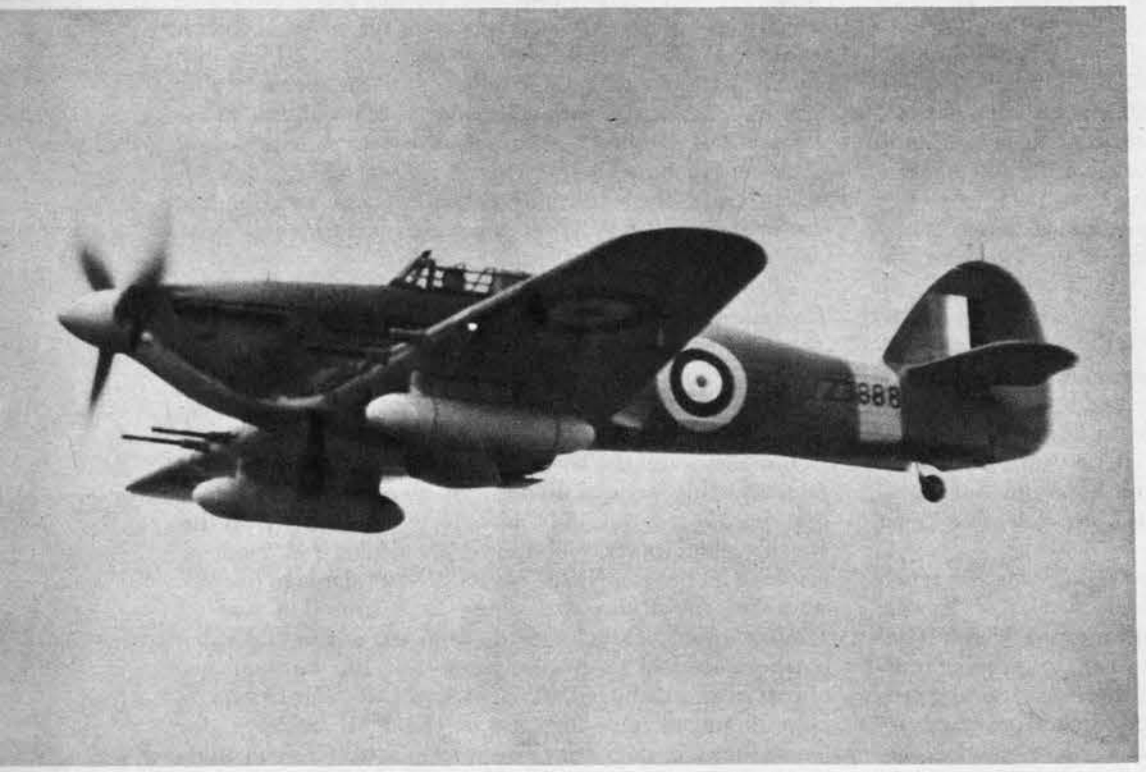
Meanwhile, the RAF's Coastal Command had been insuring the flow of lend-leased supplies to the island kingdom. To the Coastal Command falls the job of patrolling all British waters. Flying far beyond the range of fighter escorts, RAF's patrol bombers must rely on their own limited armament or their pilots' skill. Smaller anti-ship planes, like the torpedo-carrying versions of the Beaufighter and Beaufort, carry on a constant harrying of Axis supply lines in the Mediterranean while England-based craft blast German E-boats and other Channel craft (*see pages 22–25*). It is a tough job which will not end until the peace.

Throughout Allied lands the stations of the Training Command have maintained a steady flow of new, fully prepared men to crew British aircraft. And wherever the British Army has gone, the Mustangs and Typhoons of the Army Cooperation Command have been in there slugging. But the chief glory of the RAF today is the Bomber Command. Nightly ferrying the war to Hitler and his minions, the huge Halifaxes, Stirlings and Lancasters carrying 5½ to 8 tons of bombs apiece have blasted all the Reich's chief ports, pulverized the Ruhr and made a smoking hell of the Nazis' capital. Direct damage to steel works in the Ruhr area alone have caused a loss of 1,250,000 tons of steel and the total loss of steel must be much greater. In three months of 1942, the daily output of coal in the Ruhr fell 20%. In Turin, 70 factories have been damaged including ten of the Fiat factories. In Genoa, acres of docks have been left waste. This constant attack has meant that the enemy has been compelled to keep his finest fighters and pilots away from the Russian front. Little more than one-quarter of the German fighter force has been strung out from the White to the Black Sea, while nearly double that number have been held in Western Europe. In all, the Bomber Command has destroyed or seriously damaged close to 3,000 factories and industrial works in Axis-held Europe.

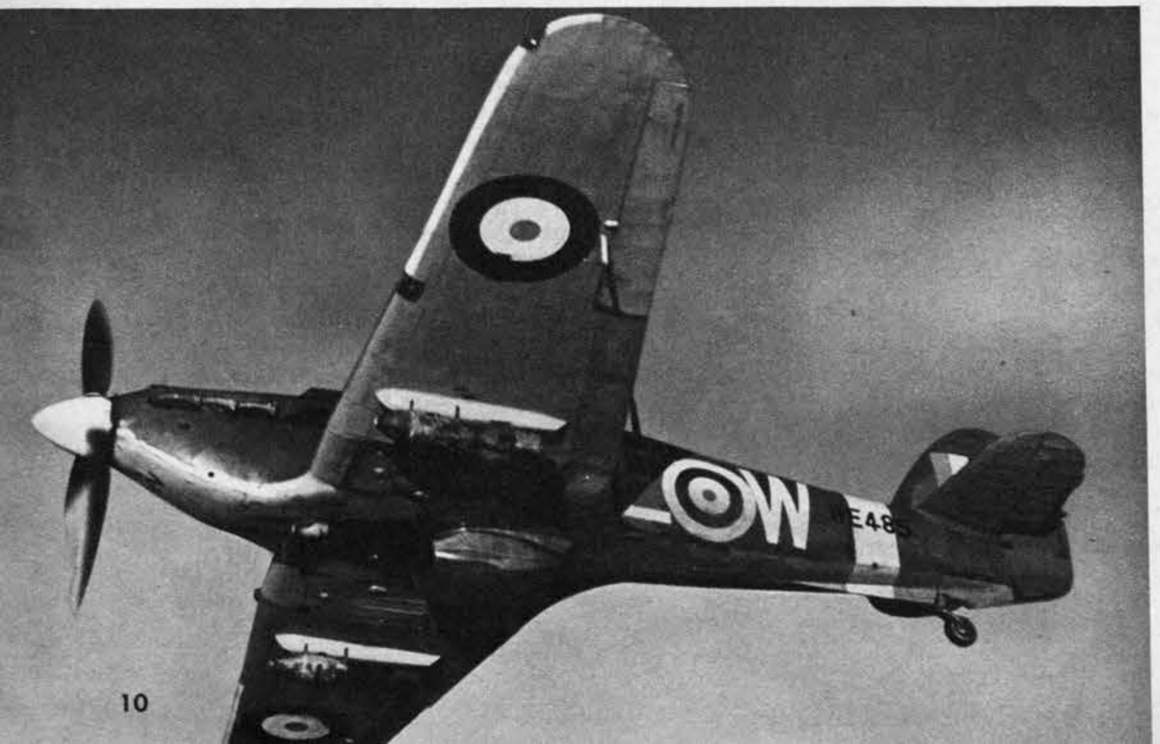
The planes which have carried democracy's banners throughout the European theater since the first gun was fired are pictured on the following pages. Though Americans can be proud of the USAAF as the biggest and strongest assemblage of planes in the world, the airplanes of the Royal Air Force rate close to the top in every category. They have done the war's greatest job.



**TALL OVAL FUSELAGE** and almost straight wing mark Hurricane in head-on views. High-set tailplane may be visible above the wing. Three-bladed prop cannot be seen by the eye, is not recognition feature.



**BOMBS OR FUEL TANKS** may be suspended from Hurricane's wing (*above, below*). Thickset fuselage and broad fin and rudder contrast with sharply pointed nose, make plane appear to have tail-heavy sit.



# HURRICANE & SPITFIRE

## Have retained superiority since the Battle of Britain

From the chaos of air war which has since been named the Battle of Britain, two great airplanes arose. These were the RAF's famed single-engine fighters, the Hawker Hurricane and the Supermarine Spitfire. Between them they accounted for well over 2,000 enemy craft during the first year of war. The Hurricane was first of the pair to go into production and outnumbered the Spit almost two to one. For this reason it bore the brunt of the early fighting. However, Spitfire's performance was slightly better—it had more speed and climb and operated at higher altitudes—so that in the later days of the battle its percentage of kills per plane was higher.

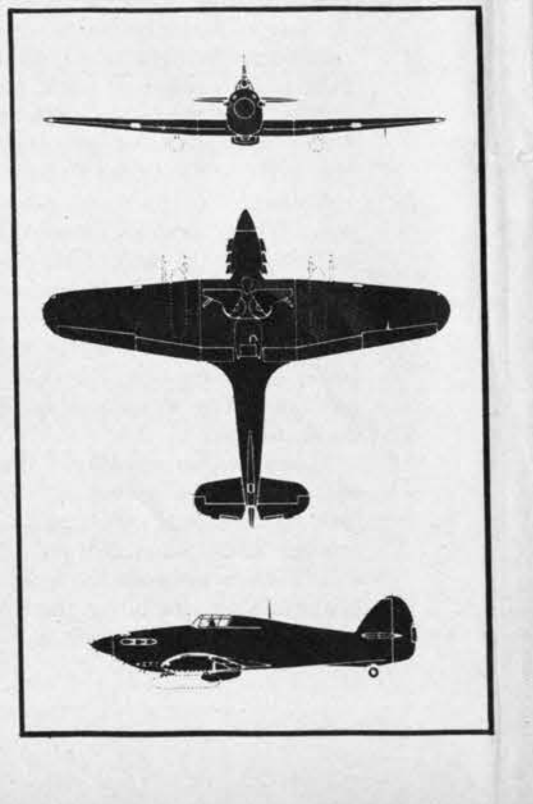
As the war progressed and the need for specialized aircraft became obvious, the Hurricane took over many jobs which were undreamed of at the time of its original design. To protect hard-pressed convoys, it was catapulted from merchantmen as an expendable interceptor of German bombers. At Narvik, a squadron of Hurricanes flew from the carrier H. M. S. Glorious. In November 1941, others were equipped with bomb racks and used as one of the first fighter-bombers. The Hurricane has also been used as a fighter and ground-attack plane in the African desert and Burmese jungles. Most recently, the Hurricane IID with two 40-mm. cannon in the wing has been used as a tank-buster. Though these adaptations have changed the airplane's appearance in detail, they have not fundamentally altered its personality.

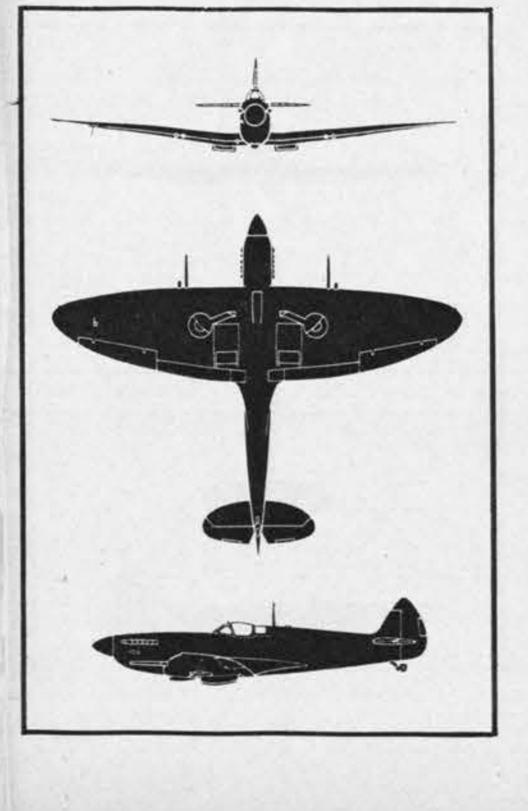
The Spitfire, which still remains one of the greatest fighters in the air, has also undergone a number of alterations (*see Journal, Oct. issue*). As with the Hurricane, many of the early changes were in the power plant to boost speed and altitude. From the original two-bladed fixed-pitch propeller, it changed first to a three-bladed variable-pitch prop and then to a three or four-bladed constant-speed propeller. Changes in the airframe to accommodate refinements have materially altered the appearance of the Spit from its prototype. The Marks XII and some Mark V's have had the typical elliptical wing clipped to provide greater speed and maneuverability at low altitudes. This reduces the span by 5 ft.

Marks VI and VII, on the other hand, had very pointed wings. The new Mark XII is clip-winged and has a new Rolls-Royce Griffon engine. A large spinner which fairs into the belly-line of the fuselage gives this model a nose-low appearance and a markedly different sit in the air. The Mark IX, most important operational version, has a slightly longer nose and a foot more of overall length and has radiator intakes at the root of each wing. Fin and rudder is more pointed.

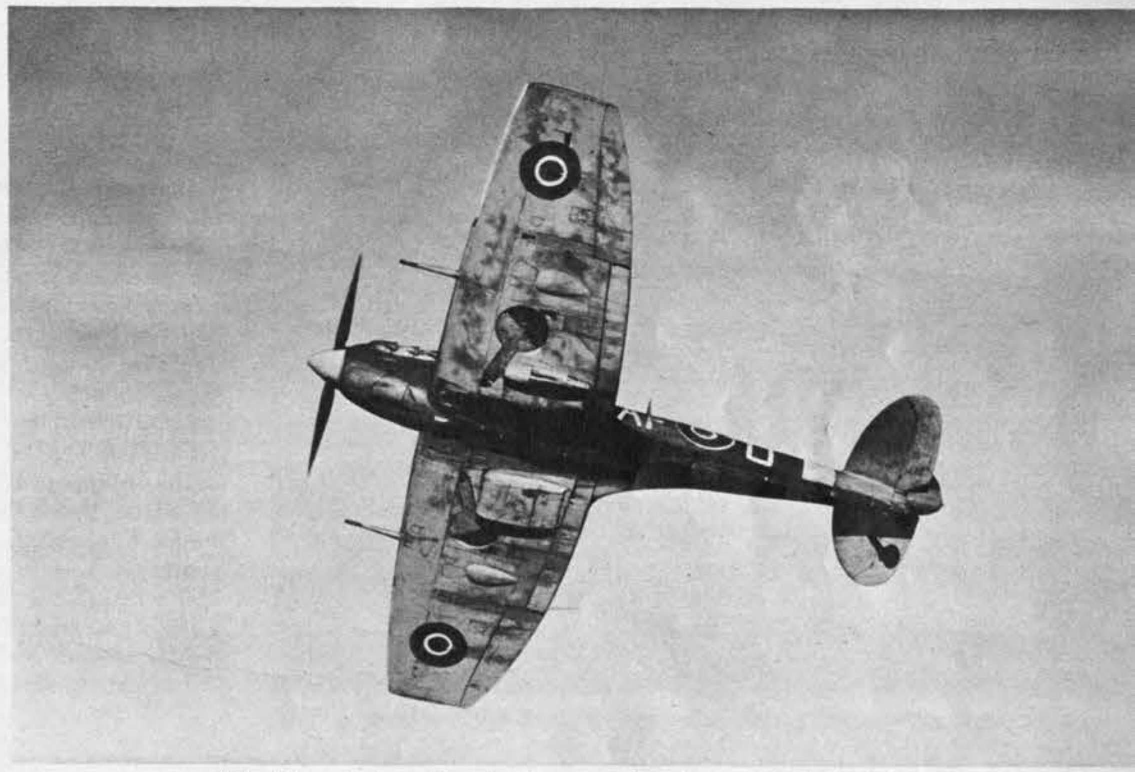
**RECOGNITION:** Hurricane has wing and tailplane which taper evenly to rounded tips. Wing has slight dihedral from a straight inboard section. Nose is pointed. Fuselage has straight lower line, humped upper surface. Fin and rudder is broad and rounded. Span, 40 ft.; length, 31 ft.

The basic Spitfire, subject to variations above, has distinctive elliptical wing and tailplane. Fuselage belly curves down from high spinner and up to high-set tail. Upper surface of fuselage runs level from cockpit fairing to tail. Fin and rudder is tall, narrow, rounded. Span, 37 ft.; length, 30 ft.

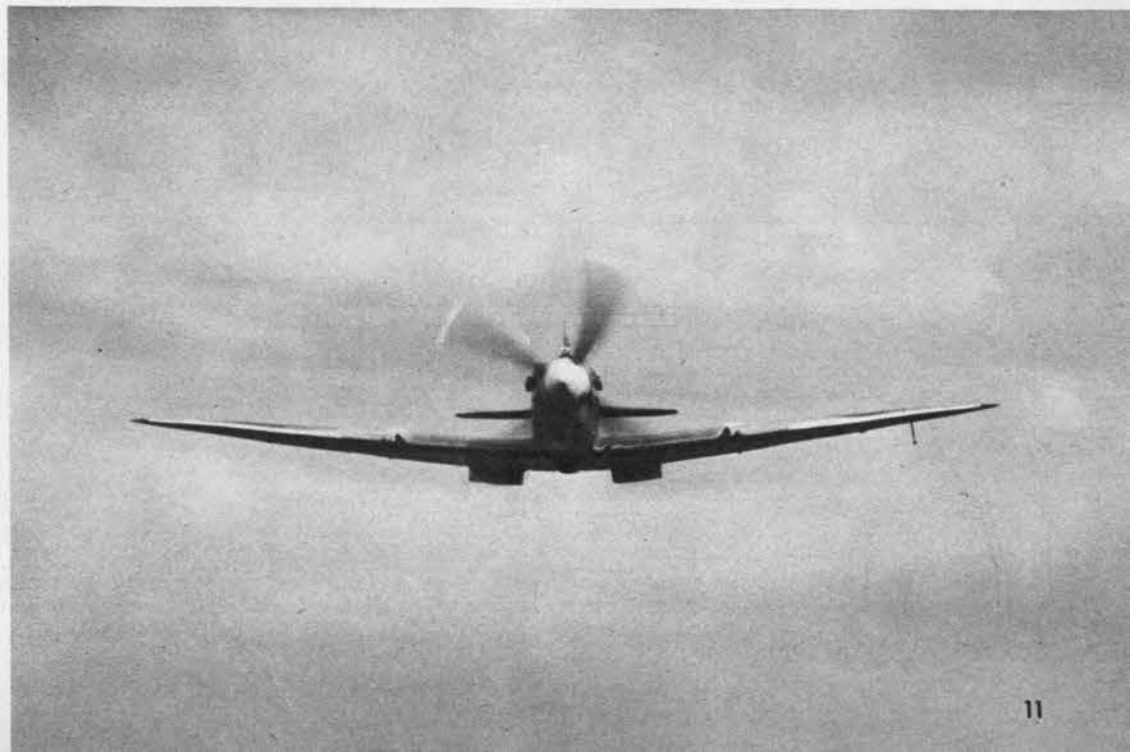




**SPITFIRE FOUGHT AT NIGHT** in Battle of Britain. Silhouetted Mark IX's (*above*) are now used chiefly for high-altitude fighting. Wing form and straight sit in the air are best clues in such difficult views.



**CLIP-WINGED MARK V** (*above*) has single radiator intake on starboard wing. Mark IX (*below*) shows two intakes at wing roots. Dihedral is very clear; wing tapers from thick chord at root to thin wingtips.



# TYPHOON BOMBER AND BEAUFIGHTER

## Constantly harass Axis outskirts of Europe

Both the Beaufighter and the Typhoon were designed as fighters, but have scored more outstanding successes in other capacities. The Beaufighter is the more versatile, continuing as day, night, and long-range fighter, while it has added strafing, tank-busting and land-based torpedo-carrying to its occupational list. The Typhoon with a bomb load of 1,000 lb. and mounting four cannon in the wings, is now more commonly seen than the original type with twelve machine guns.

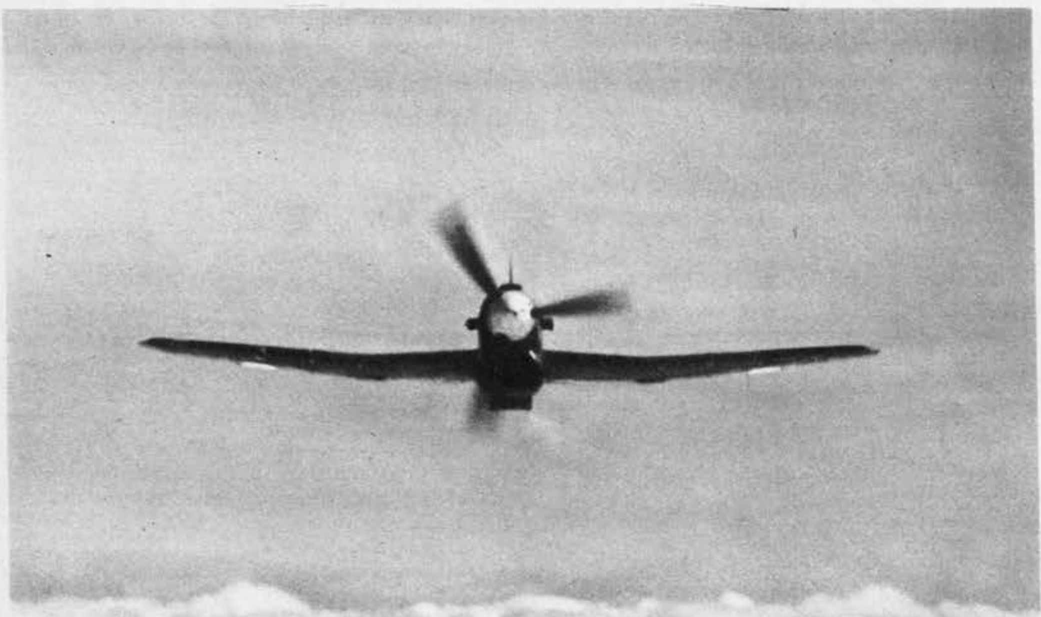
The Typhoon was built around the 2,400-h.p. Napier Sabre engine, and was intended as a bomber-destroyer, which accounts for its big size. The Napier motor gives the Typhoon a speed of more than 400 m.p.h. so that the Typhoon is very difficult to recognize when flying high, and hard to hit during its bombing dives.

Although the U. S. classification does not exist in the RAF, the Beaufighter is an attack plane, used against all targets. It is the most powerfully armed fighting plane in service, with a 765-lb. weight of fire per minute, coming from four machine guns mounted in the starboard wing, two in the port wing, one in the observer's cockpit, and four 20-mm. cannon in the nose. Descended from the Beaufort, from which it derives its range and structural strength, the Bristol plane is usually seen with two Hercules radial engines, although one model is powered with Merlin inlines.

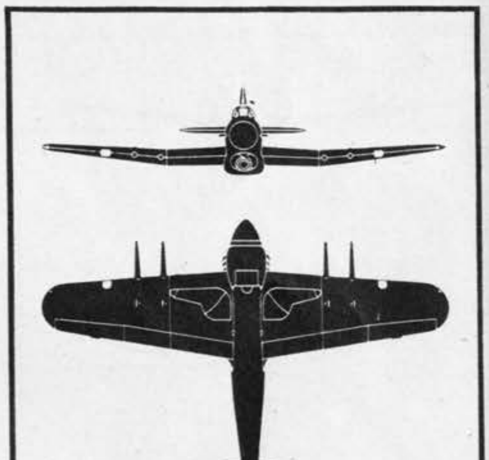
**RECOGNITION:** Deep radiator intake under the nose distinguishes the Typhoon. It is a low-wing airplane, with a dihedral on the outer panels only. Wings are equally tapered with rounding edges, the shape being repeated in the tailplane. Fin and rudder is rounded, and extends below fuselage. Span, 41 ft.; length, 32 ft.

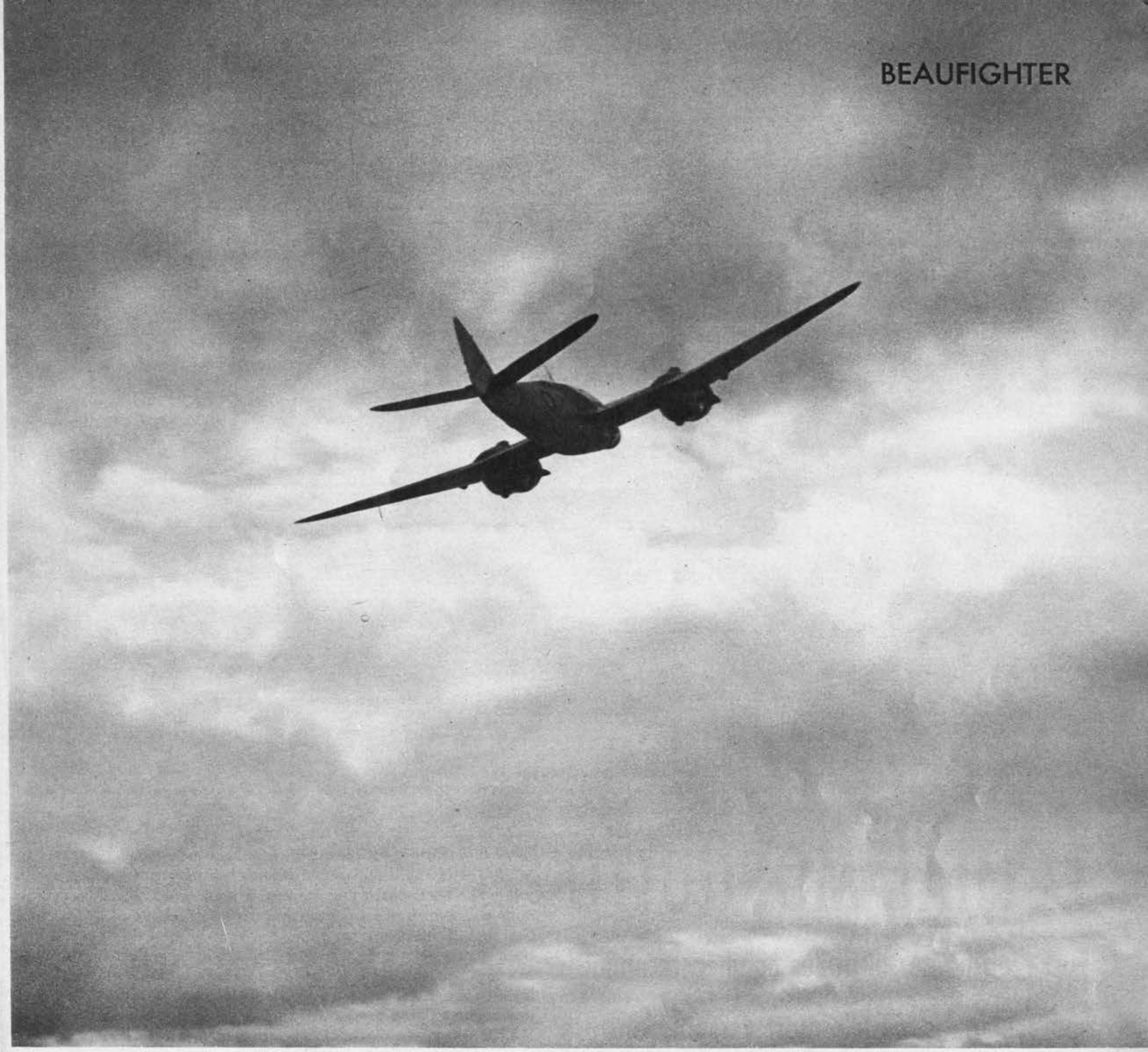
The Beaufighter is a midwing monoplane. The fin and rudder is broad and triangular. Engine nacelles are underslung, extend slightly beyond the stubby nose. The tailplane is broad, rounded, has a sharp dihedral and V cutout. Span, 58 ft.; length, 41 ft.

**TYPHOON BOMBING RAIDS** are usually connected with Fortress raids on Western Europe, and diversionary sweeps. Typhoon rate of climb is phenomenal.

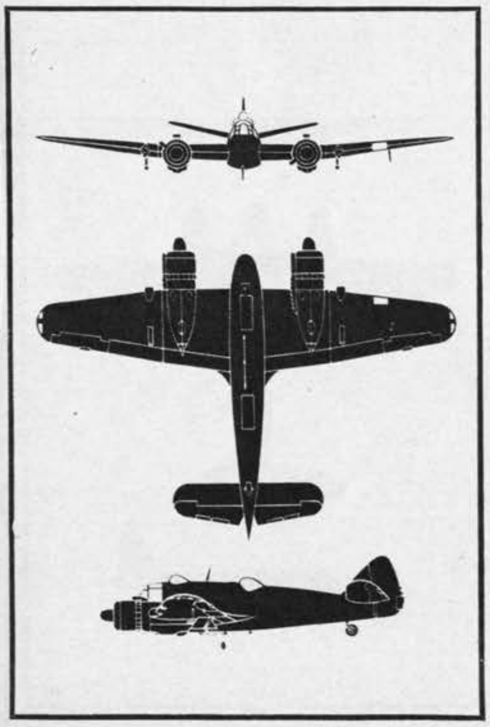


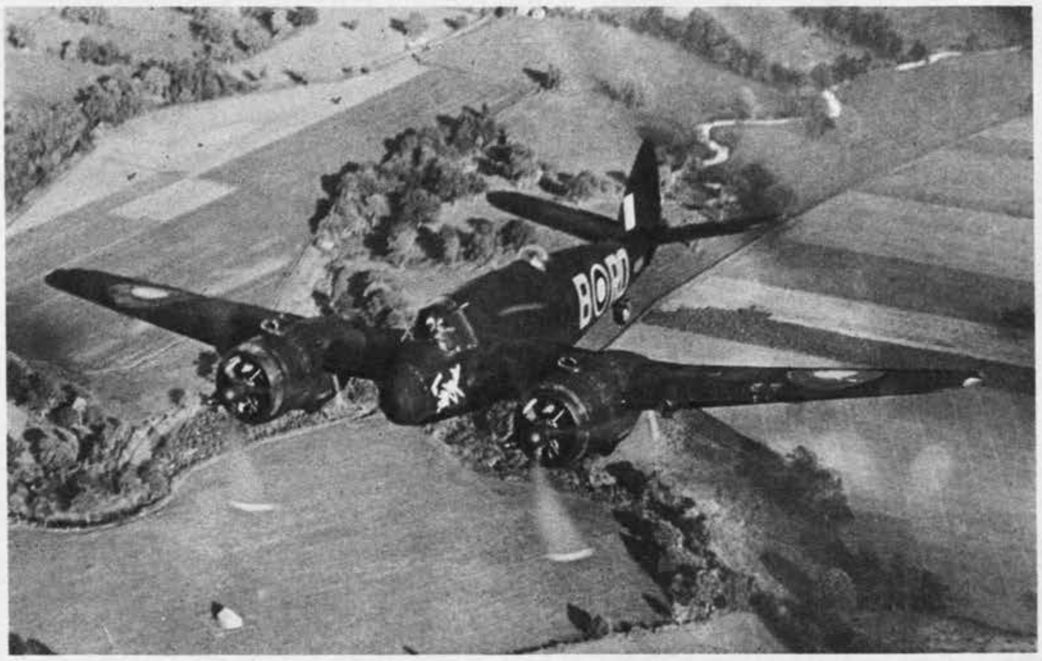
**DEEP UNDER-COWLING** which houses the oil-cooling system of the high-powered Sabre engine shows in head-on view. The Typhoon is very maneuverable, and can turn inside the FW-190 even when loaded.





**REAR VIEW SHOWS** dihedral of the Beaufighter's tailplane, a feature added to counteract swing during take-offs and so avoid damage resulting from slips off the runway at night. Torpedoes are carried externally, reducing speed below usual 335 m.p.h., but making changes in the fuselage unnecessary.





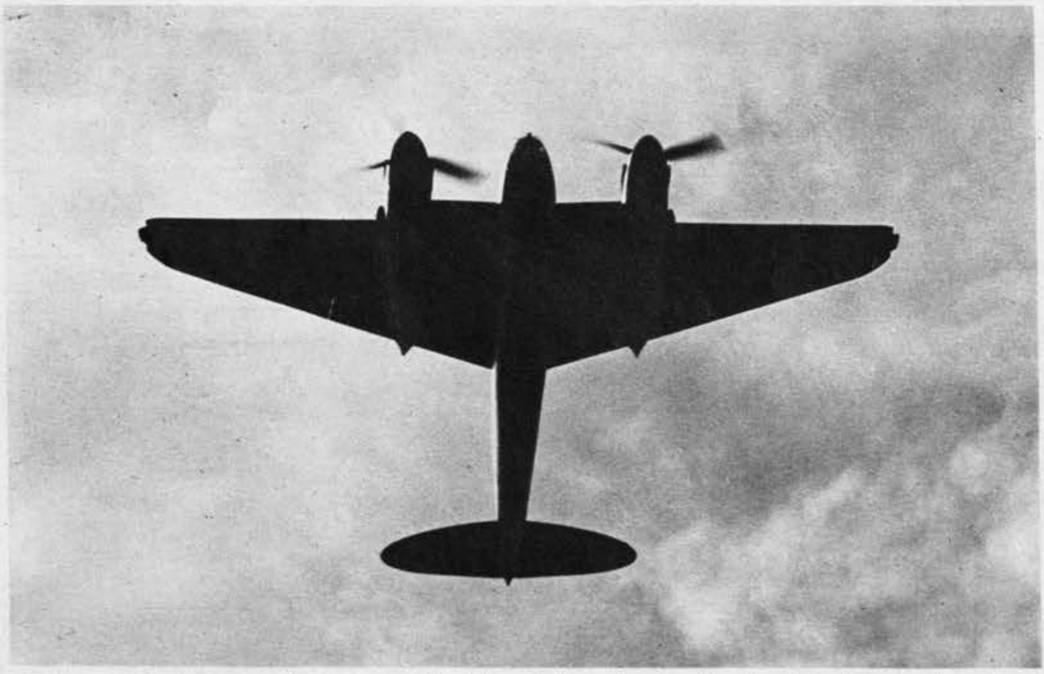
**BEAUFIGHTER IS SCOURGE** to Axis shipping, also protects Coastal Command bombers on anti-sub patrol. Japs name it "Whispering Death" because of swift, silent approach at low level over the jungle.

MOSQUITO'S GREAT SPEED MAKES DEFENSIVE ARMAMENT UNNECESSARY, GIVES AIRPLANE CLEAN LINES FREE OF GUN TURRETS AND OTHER LARGE PROTUBERANCES

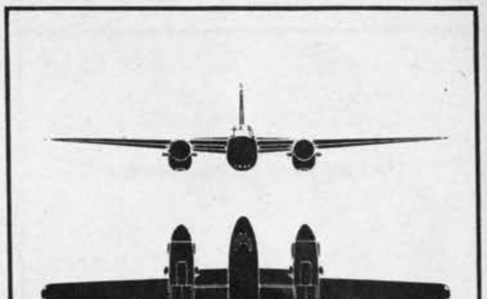
# LETHAL MOSQUITO

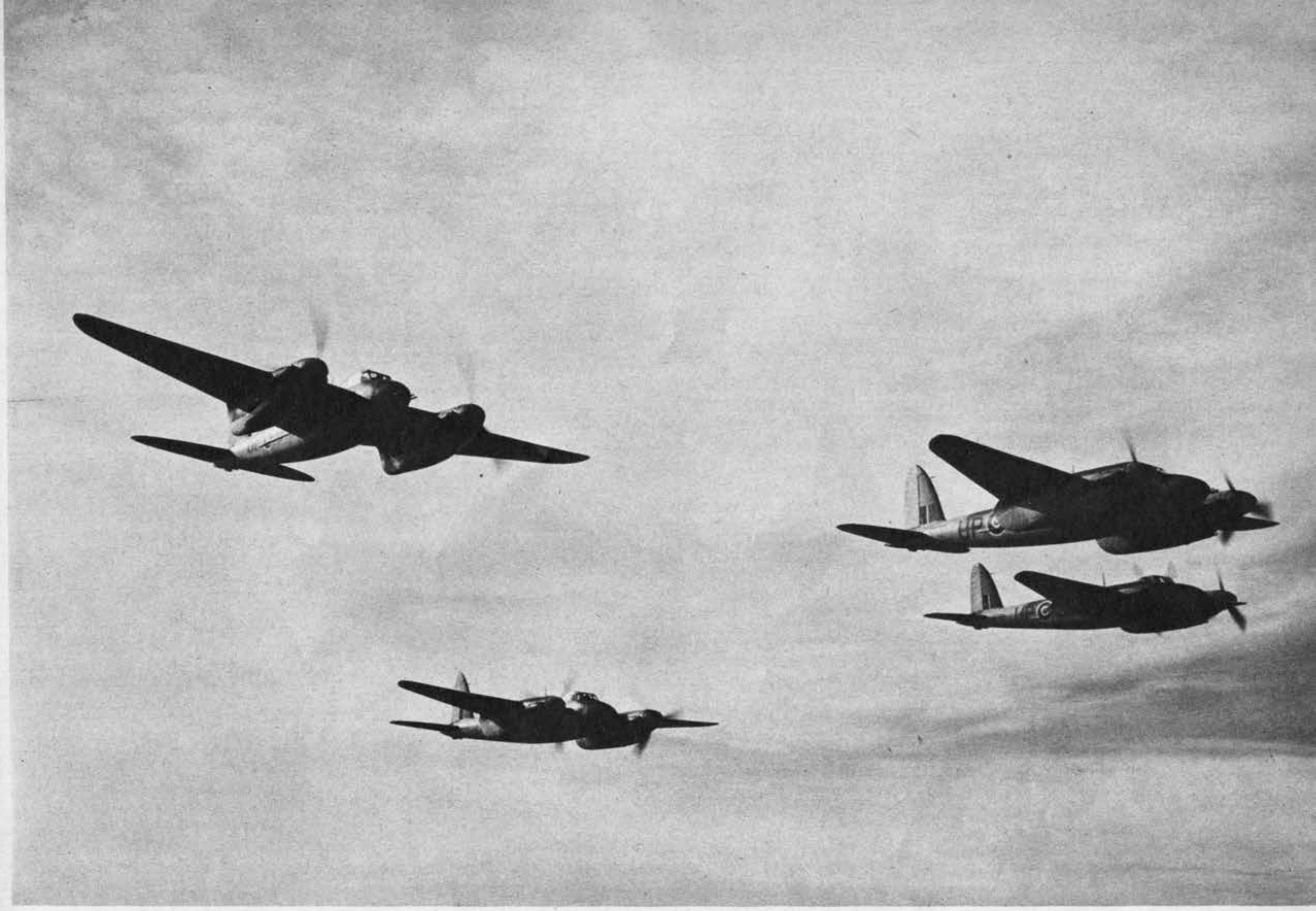
## Fast nightfighter, intruder bomber, reconnaissance plane is world's most versatile aircraft

Since entering operations as an unarmed high-speed bomber late in 1941, the De Havilland Mosquito has performed about every job in the book. With four 20-mm. cannon and four .303 machine guns mounted in a solid nose, the Mosquito is one of the world's best nightfighters and tank-busters. With a glassed-in nose, it has been a superlative light bomber, spot-bombing Party headquarters and Nazi demonstrations when least expected, flying in at roof level to avoid the radar. In a sub-stratosphere version with modified engines, extra wing tanks and low-drag finish, it has been the RAF's best photo-reconnaissance plane. In every use, its twin en-



**WING RADIATOR INTAKES** project between the Mosquito's engine nacelles, break straight leading edge of the wing. Nacelles and nose project evenly. Long elliptical tailplane repeats curved lines of fuselage.



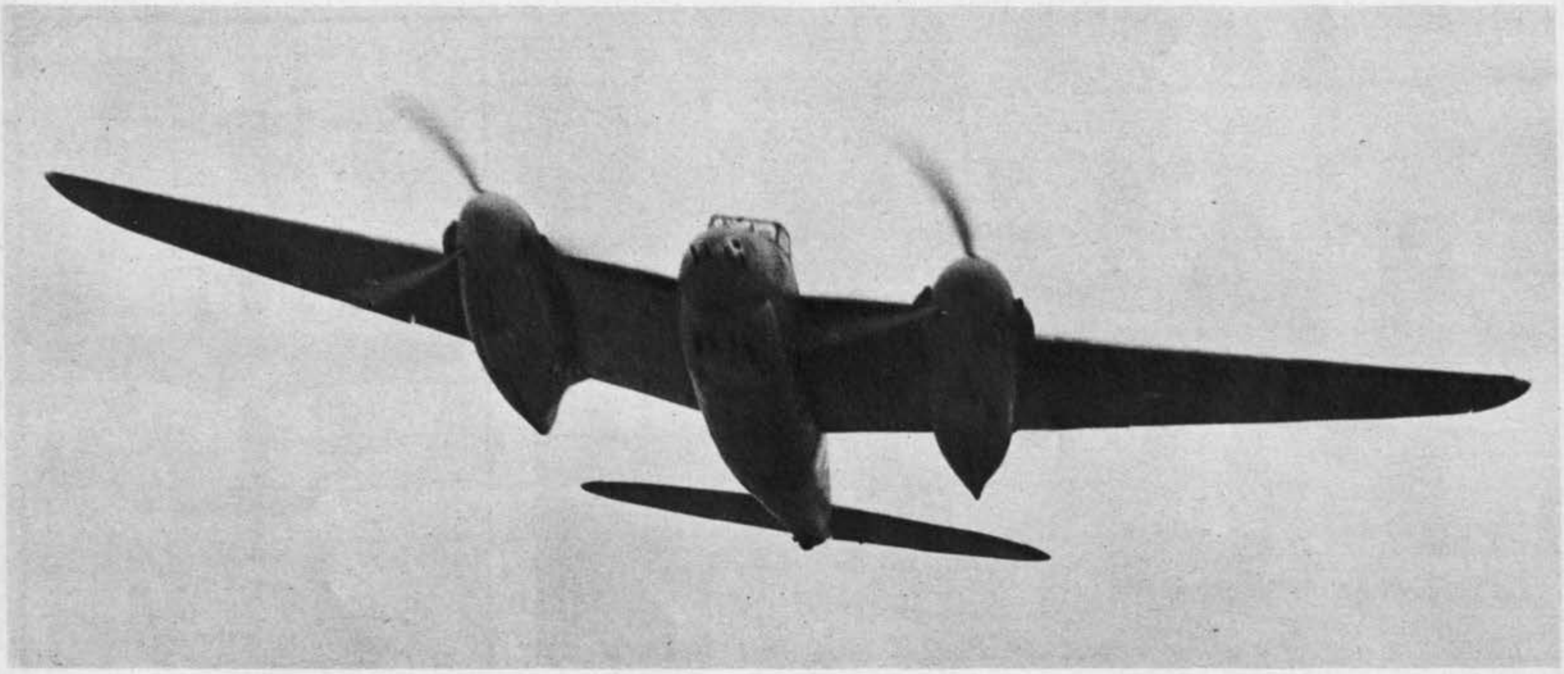


MOSQUITO FIGHTERS FLY FORMATION ON WAY TO CONTINENT. THIS TYPE IS DISTINGUISHED BY SOLID NOSE AND PROJECTIONS OF FOUR .303-CAL. MACHINE GUNS

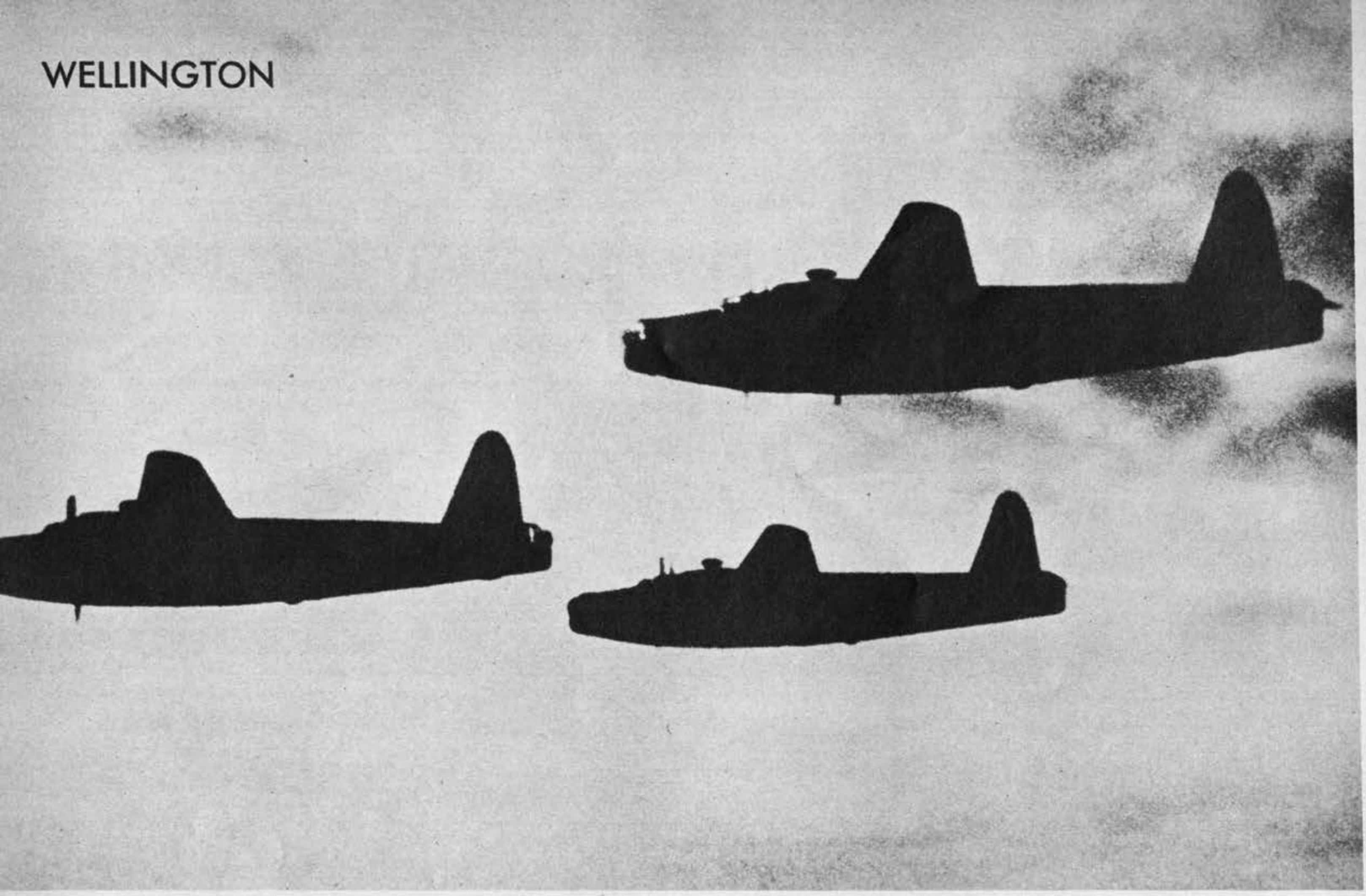
gines have given it a speed of over 400 m.p.h., enabling it to get in its blows before being discovered and to outrun interceptors on the way home.

The all-wood construction of the Mosquito's airframe has been a production godsend. In this war of metals, there has been a less pronounced shortage of wood. Woodworkers in England were an untapped source of skilled labor. Basic components of the Mosquito's production could be distributed among over 400 subcontractors. With these advantages the Mosquito was in operational use only 22 months after its original design. In combat, the wood skin gives a low-drag surface, does not splinter when struck. It can be quickly and easily repaired and will stand up even under the shock of belly landings.

**RECOGNITION:** The design is aerodynamically clean. The fuselage tapers from a rather pointed nose; only the glazed cockpit breaks the contours. The wing has a straight leading edge, pronounced taper on trailing edge. Tailplane is smooth ellipse; fin and rudder is tall and elliptical. Wing radiators cause leading edge to extend forward between twin nacelles. Nacelles project evenly with nose, slightly beyond trailing edge. Span, 54 ft.; length, 41 ft.



**TWO INLINE ENGINE NACELLES** are slung under Mosquito's high midwing. The two Rolls-Royce Merlin 21 engines drive airplane through the air at over 400 m.p.h., make the Mosquito the fastest light bomber in the world and one of the fastest aircraft in service. It can outrun most interceptors.



WELLINGTON'S FUSELAGE IS VERY DISTINCTIVE, WITH BLUNT NOSE AND TAIL, STRAIGHT BACK AND CURVED BELLY-LINE. FIN AND RUDDER IS TALL AND TRIANGULAR

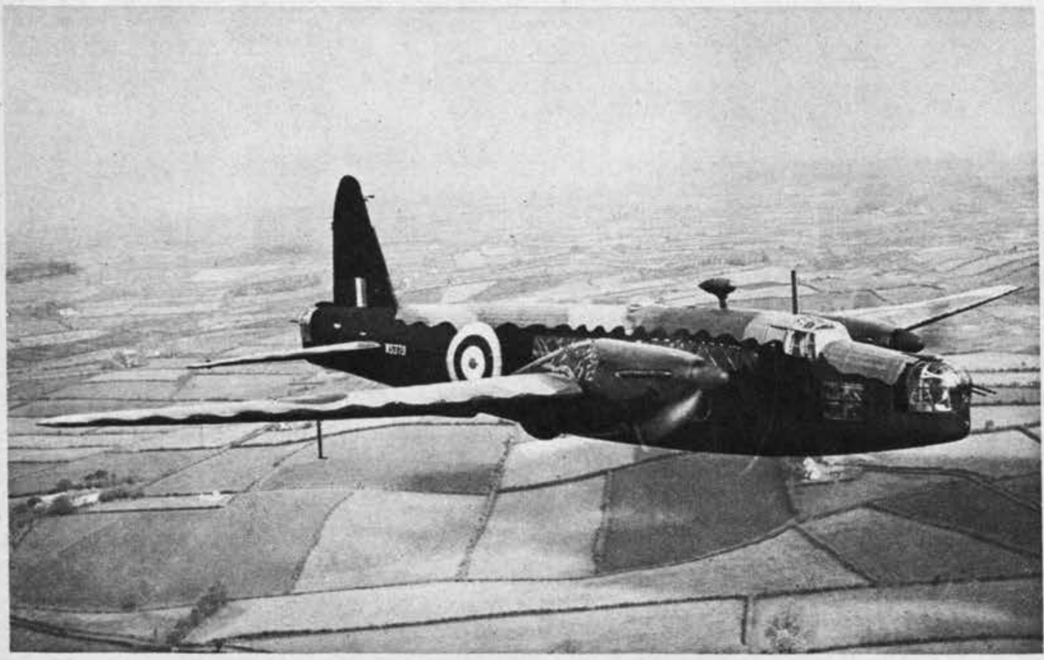
# WELLINGTON, SUNDERLAND

## Have fought since beginning

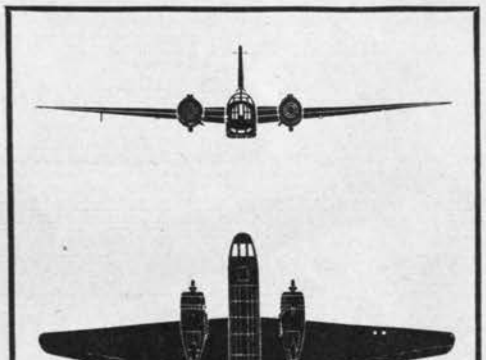
Among the RAF's oldest planes are the Bomber Command's medium, the Wellington, and Coastal Command's flying boat, the Sunderland. Both were in service at the outbreak of war. The Wellington, in fact, made the first bombing raid of the war, an attack on Wilhelmshaven, Sept. 4, 1939. Both are doing a good job today.

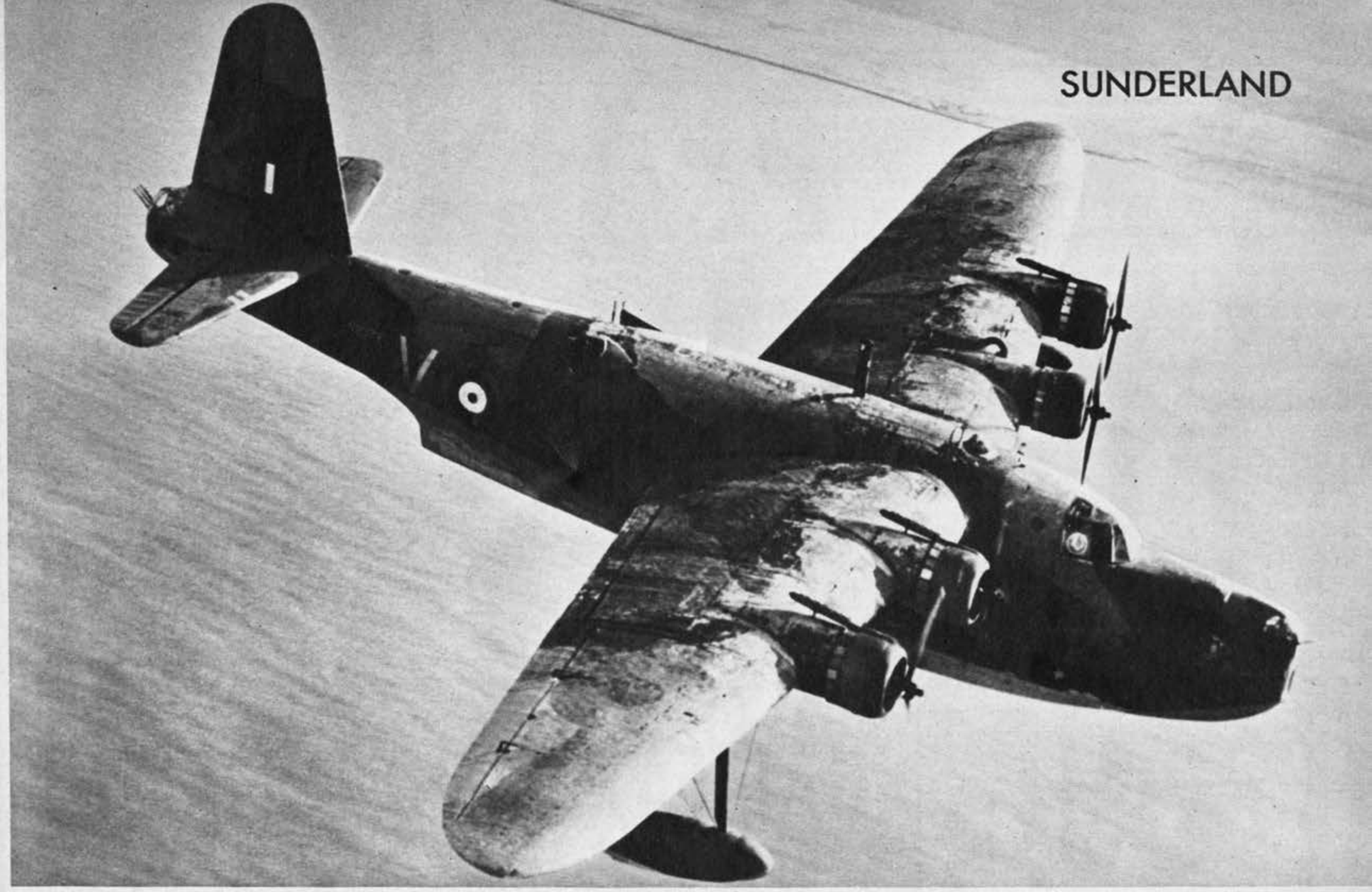
Originally, the Wellington was mainstay of the small RAF bombing force. Performance in Mediterranean has been exceptional. In Sicily it has been a fine ground-support plane, spotting targets with great precision in advance of the troops. Prior to the invasion it helped clear land and water areas, bomb ground objectives, torpedo ships. It has worked both as a minelayer and minesweeper. In the latter use, known as "Wedding Ring Wimpy," it carried a cumbersome ring about two-thirds the wingspan in diameter which, being charged, set off magnetic mines when the plane flew low over them.

Like most of the older RAF planes the Wellington has gone through a number of variations. Different models have been powered by radial Bristol Pegasus or Her-



**ENGINE NACELLES** of Wellington are bulky, are set midwing. This particular model has Merlin engines. Basket-weave structure that forms Wellington's peculiar geodetic airframe is visible through windows.





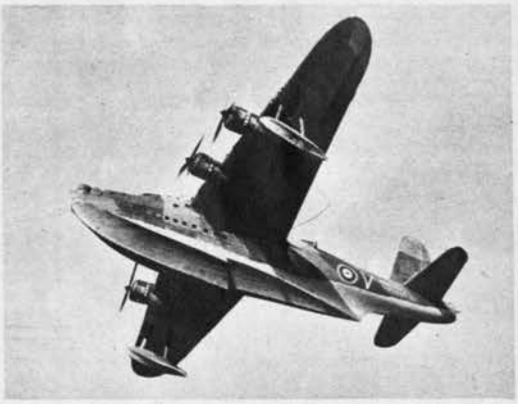
SUNDERLAND HAS CLOSE RESEMBLANCE TO JAP PATROL BOMBER EMILY. CHIEF DISTINCTIONS ARE SUNDERLAND'S STUBBIER WING, DEEPER BLUNTER HULL, TALLER FIN

cules engines, Pratt & Whitney Wasps or inline Rolls-Royce Merlins. One newer version has a solid rather than a turret nose. In this version the fuselage comes to a high point forward.

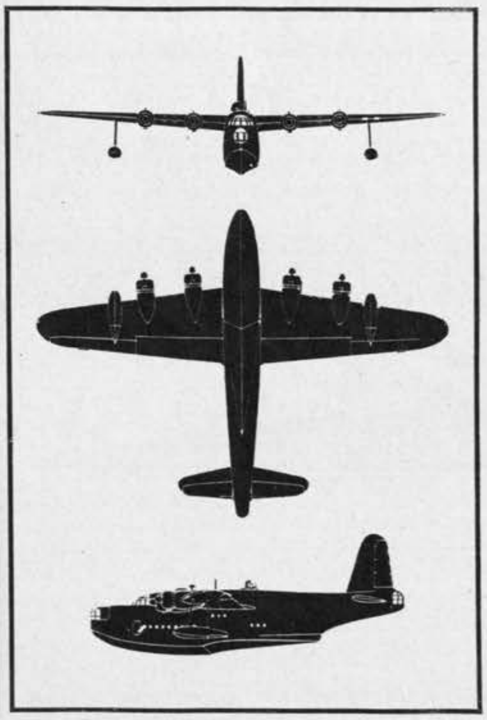
The Sunderland is an outgrowth of the flying boats built by Short Bros. for British Overseas Airways. It is a big plane with great carrying capacity. During the fight for Crete, one Sunderland brought out 80 men in a single trip. When the Kensington Court was sunk in 1940, a Sunderland rescued the entire crew. The Sunderland has two nose guns, four in the tail turret and two amidships or in a dorsal turret.

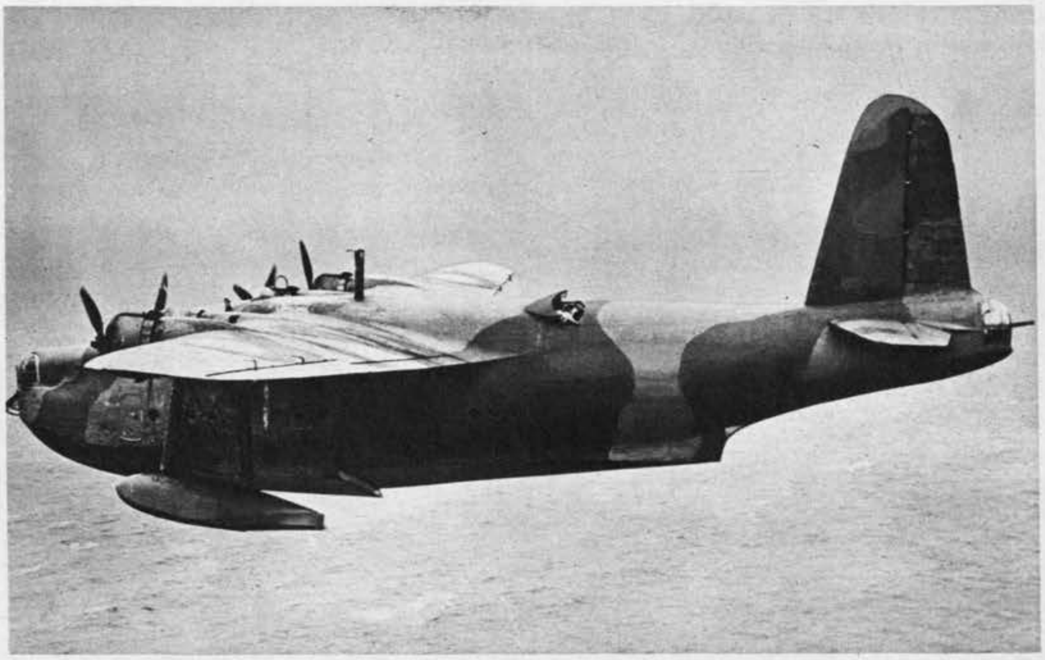
**RECOGNITION:** Wellington has thick fuselage with blunt nose, blunt tail. Long tapered wing and tailplane. Fat engine nacelles set close to fuselage. Tall fin and rudder set high on fuselage. Span, 86 ft.; length, 61 ft.

Sunderland is deep, broad-hulled flying boat. Four engines are mounted midwing in high double-tapered wing. Fin and rudder is very tall, set high above upswept tail. The nose turret gives the hull a bulldog snout. Span, 112 ft.; length, 85 ft.

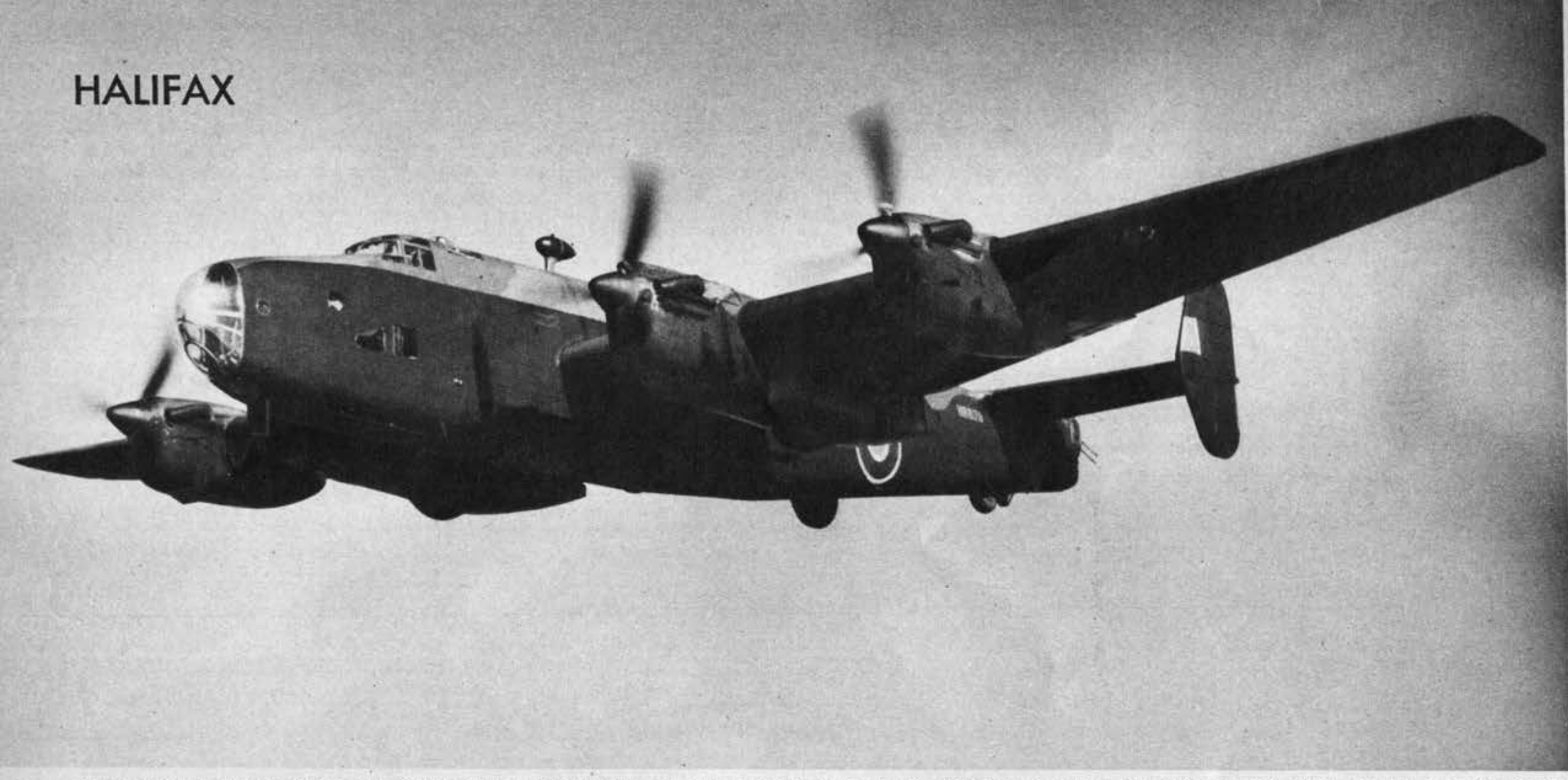


**SUNDERLAND'S BROAD WING** tapers to rounded tips. Deep flying-boat hull is impressive from below.

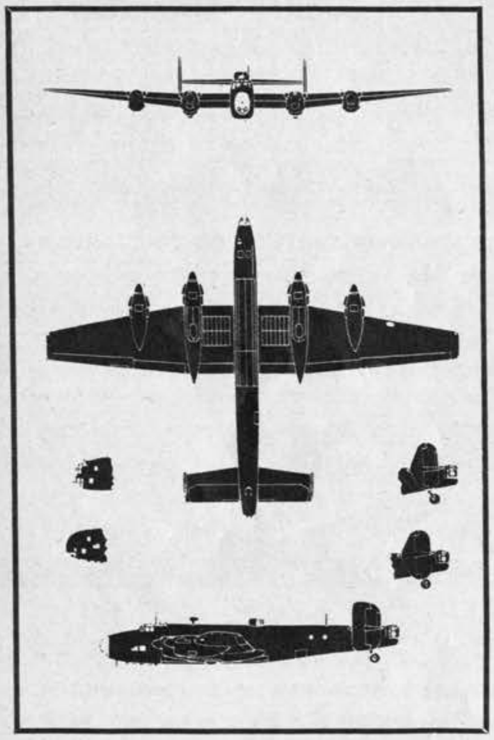




**GREAT SIZE** of British flying boat is shown by crew members watching camera plane from top gunner's position. Despite its bulk, four engines get airplane through the air at speeds over 200 m.p.h.



FIRST VERSION OF HALIFAX II HAD NEW GLASSED-IN NOSE AND SEMI-RETRACTABLE TAIL WHEEL, BUT KEPT ORIGINAL TRIANGULAR FINS AND RUDDERS, RADIO ANTENNA



# HALIFAX AND STIRLING

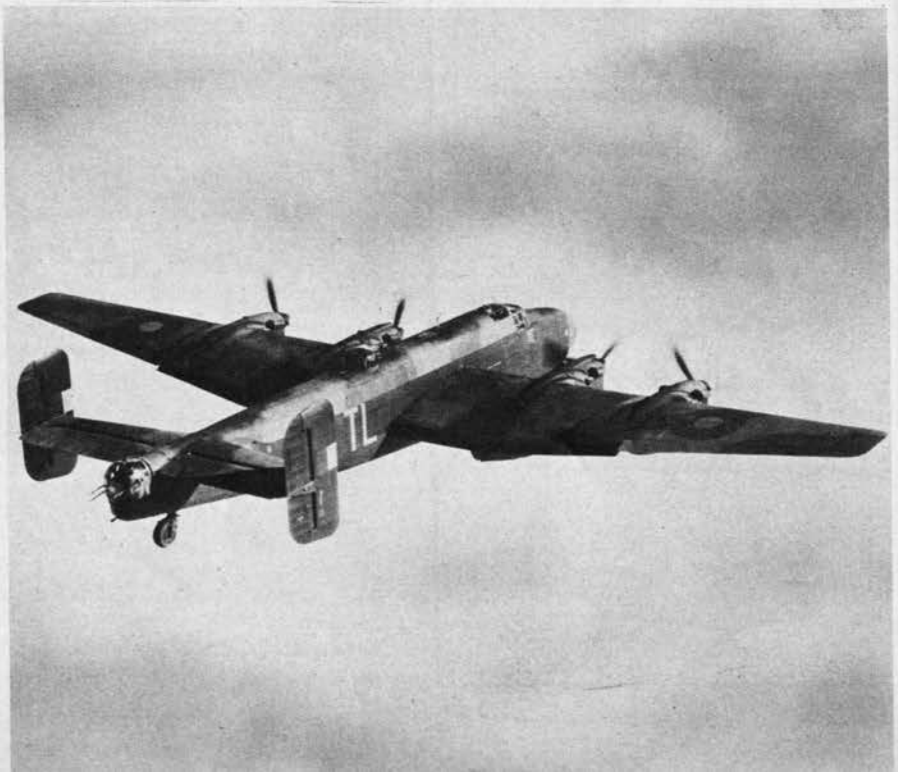
## Britain gets revenge as heavies pour weight on Germany

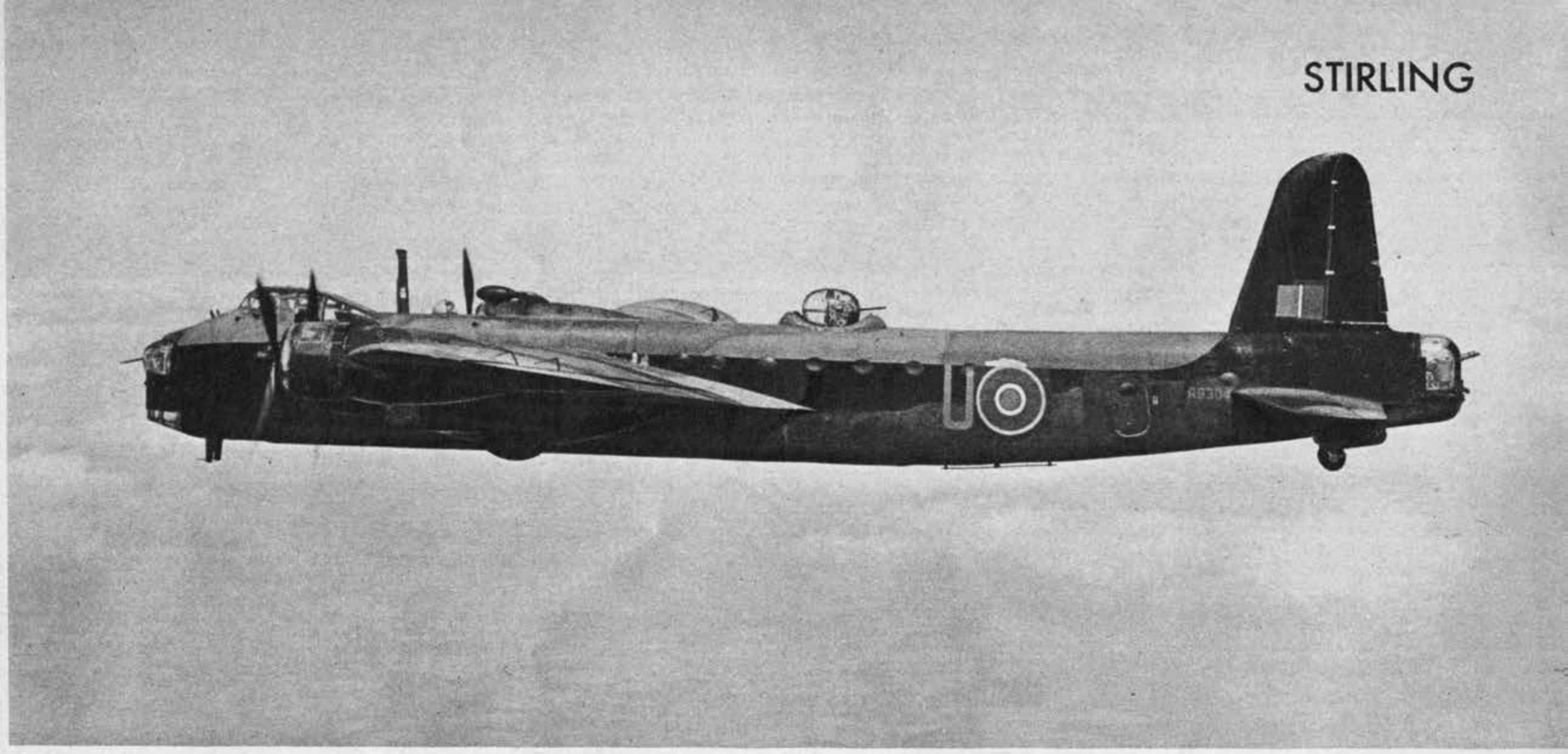
For the first year and a half of air war, Great Britain was on the defensive. Her fine fighting planes battled against almost overwhelming odds and, in the end, battled successfully. During the summer of 1940 the names Spitfire and Hurricane became household words throughout the world. But in the spring of 1941, heavy bombers, the weapons of offense, began to come off British production lines. The Short Stirling made its first sorties the night of Feb. 10, 1941. The Handley-Page Halifax went on its first mission—raids on Kiel and Le Havre—on March 11, 1941. Since that time, these craft and the newer Lancaster have stolen the headlines from their swift fighter defenders.

The Halifax has gone through a number of variations since it first appeared. Some changes in nose and tail are included in the silhouettes at the left. The original "Halibag" was of full monocoque construction, powered by four Merlin 10 engines. Its wingspread was limited to less than 100 ft. by the available hangars. Trailing-edge flaps extended from wing root to the ailerons to permit take-offs from small fields under

HALIFAX I HAS NOSE, TAIL AND DORSAL TURRETS, TRIANGULAR FINS

PRODUCTION MODEL OF HALIFAX II IS IDENTIFIED BY ROUNDED, RECTANGULAR TWIN TAILS





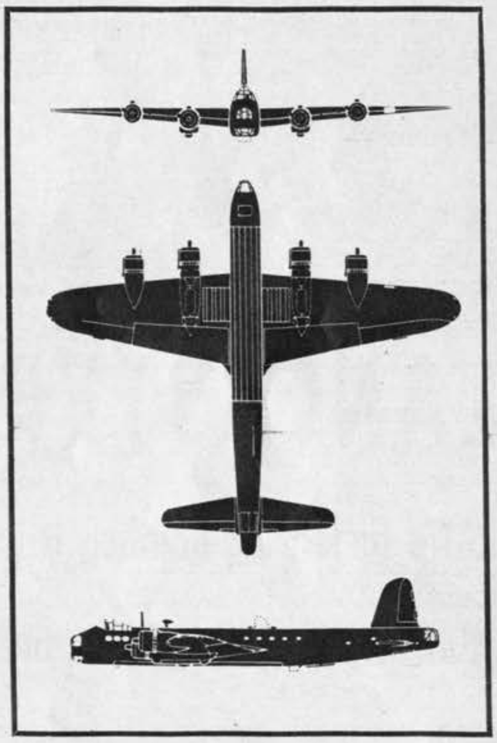
LONG BULKY FUSELAGE OF SHORT STIRLING MADE IT FIRST FLYING "BOXCAR." ANGULAR SNOUT AND TALL, HIGH-SET FIN AND RUDDER DISTINGUISH IT IN SIDE VIEW

heavy load. The original nose had a bulbous turret at the top, a prominent chin for the bombardier's position below. The twin fins came to a point at the tailplane while the rudders were broad and rounded. The Halifax II has a smooth glassed-in nose and more rectangular fins and rudders. Defensive armament is concentrated in four-gun turrets in the tail and on top of the fuselage. An intermediate stage had the new nose and the old tail assembly (*see left*). In its newest form, the performance of the Halifax compares with that of the Lancaster.

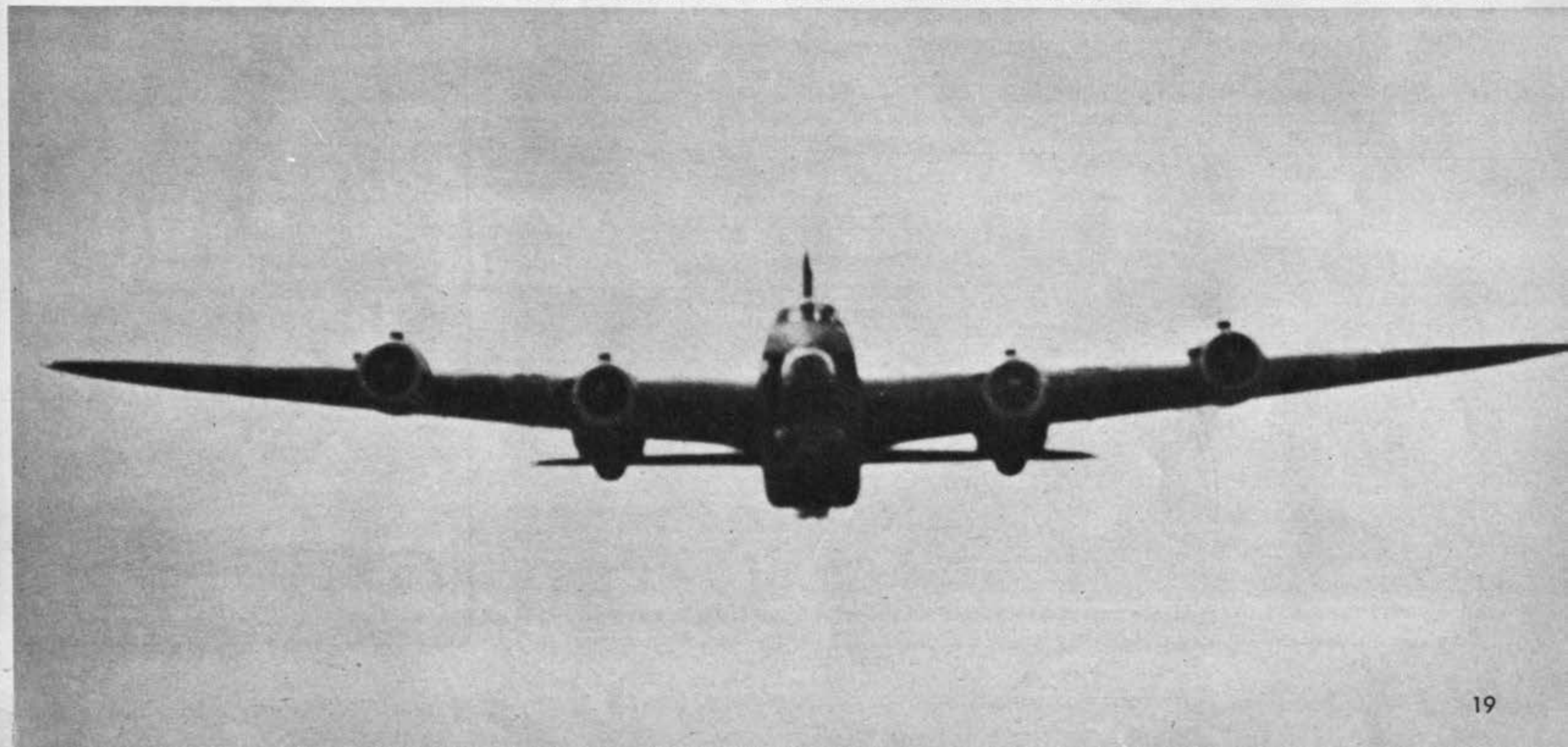
The Stirling, which is now being superseded by the Halifax and Lancaster, was once the biggest weight-lifter in the RAF's line-up, carrying a bomb load of over eight tons. Like the Halifax, its wingspan was limited by the available hangar space. Because of this and its great weight, the Stirling lands at high speed and cannot climb until its landing gear is retracted. The plane carries more armor than any other craft in the air, even its leading edge is armored.

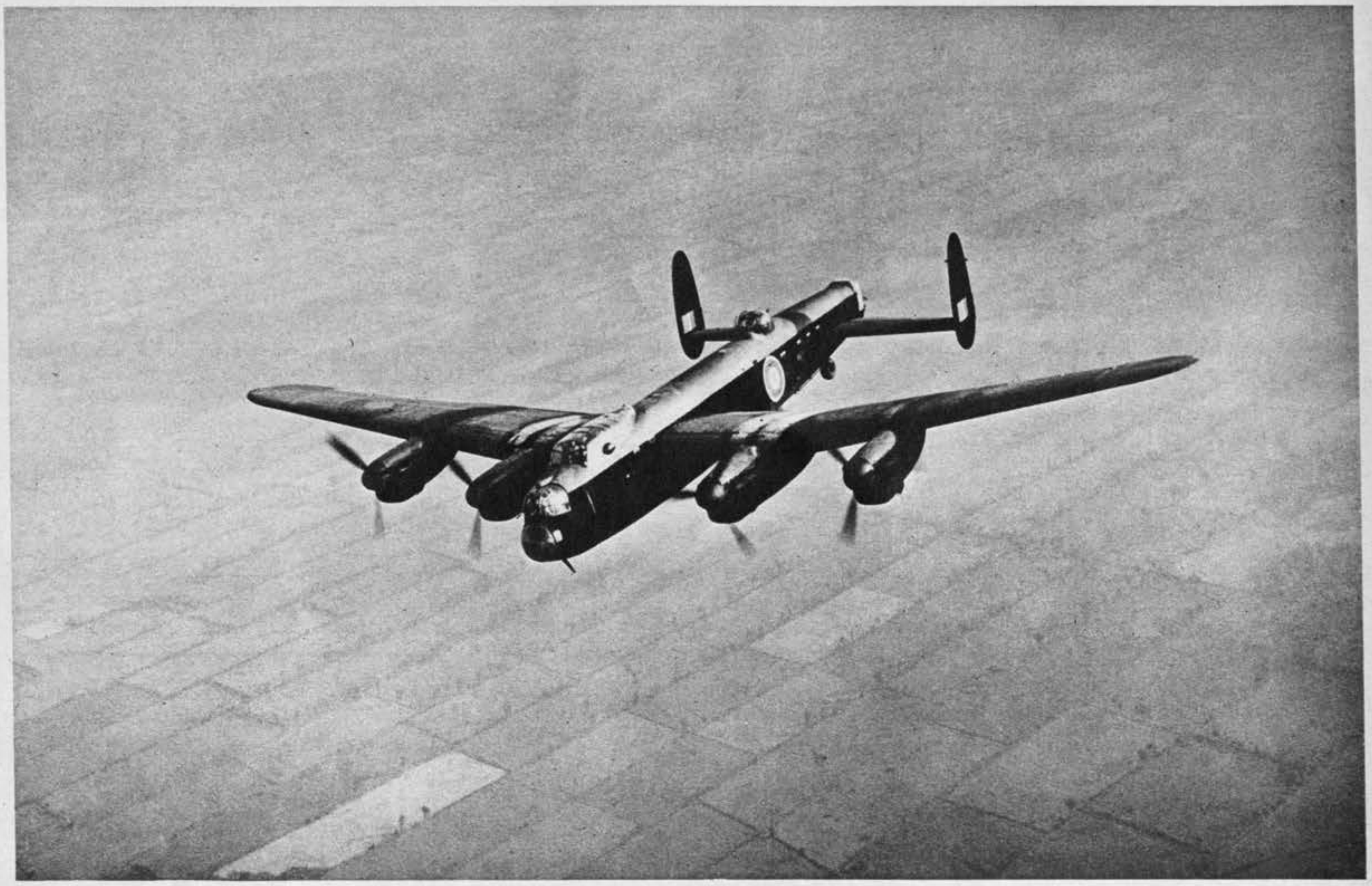
**RECOGNITION:** Despite nose and tail changes, the Halifax has a distinct character. The fuselage is long and deep-bodied, rounded fore and aft. Midwing has straight panel inboard, then tapers evenly to square tips. All nacelles are underslung, inner ones may extend beyond trailing edge. Tailplane has slight taper on leading edge. Span, 99 ft.; length, 71 ft.

The Stirling has very long fuselage with almost straight lines top and bottom. Cockpit forms noticeable hump forward of leading edge. Wing tapers evenly from thick root chord to very thin tips, with a pronounced dihedral angle. Inboard radial engine nacelles are long and underslung; outboard nacelles short, midwing. Single fin and rudder is mounted high on the fuselage forward of gunner's position. Tailplane is long and tapering. Span, 99 ft.; length, 87 ft.



STIRLING'S THICK WING, TAPERING TO VERY THIN TIPS, AND MIXED MOUNTING OF ENGINES, TWO HIGH, TWO LOW, MAKE PLANE UNLIKE ANY OTHER SEEN HEAD-ON





LIKE ALL BRITISH HEAVIES, "LANK" HAS LONG INBOARD NACELLES, BOXCAR FUSELAGE. MOST PROMINENT DISTINCTION IS GUITAR-PICK FIN AND RUDDER

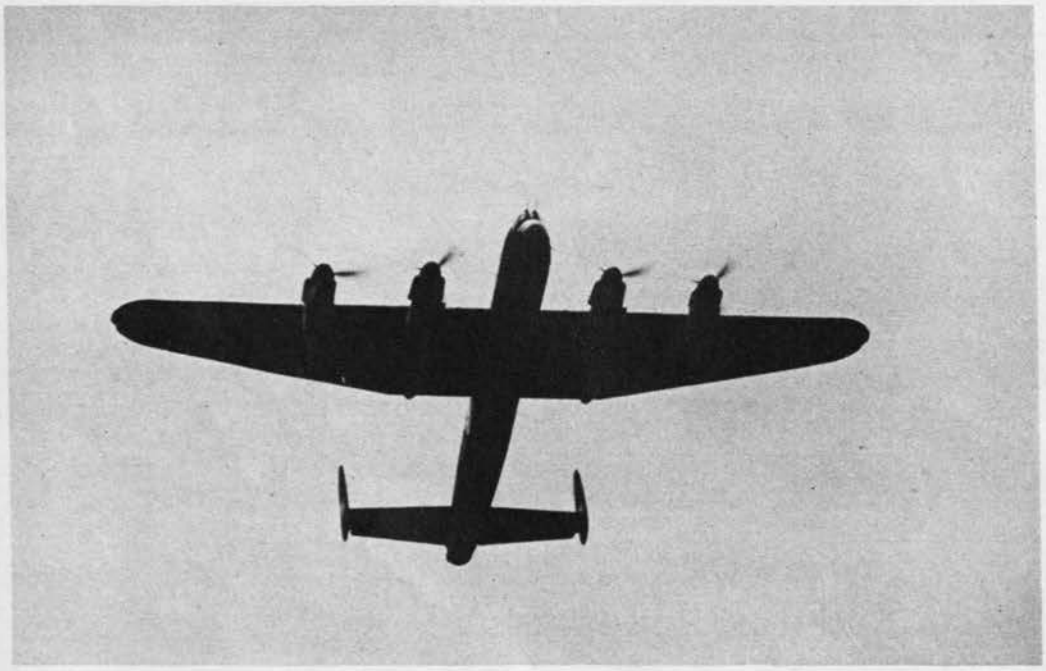
# LANCASTER

## RAF's fastest big bomber, it is mainstay of Bomber Command

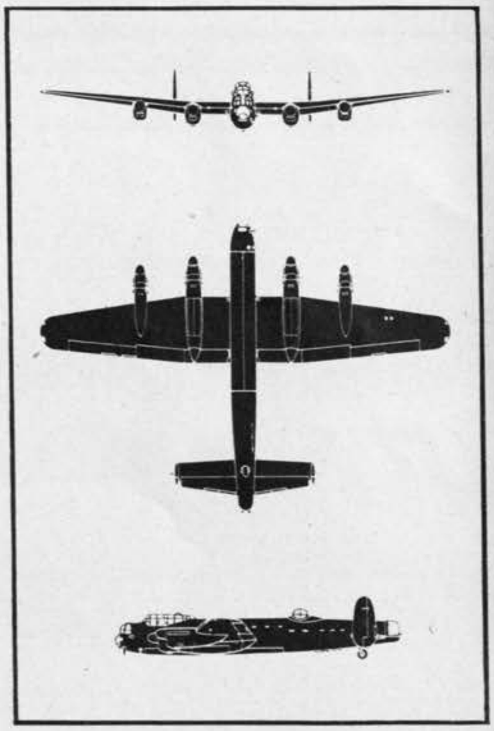
Since April 1942, when the Lancasters went out on their first daylight sweep, a roof-level attack on the Diesel plant at Augsburg, they have grown into the greatest strategic weapon in the European air war.

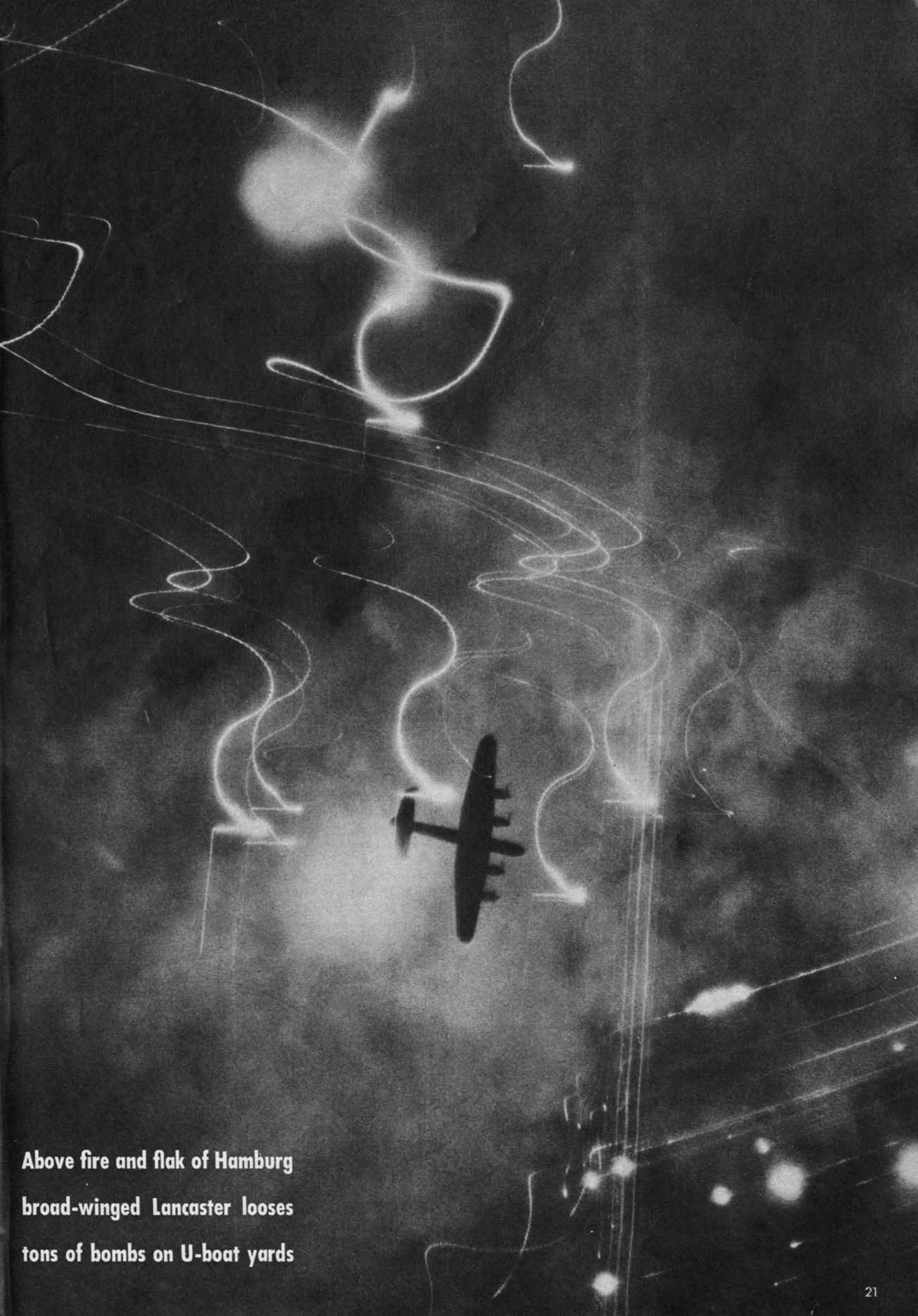
With a maximum speed of over 300 m.p.h., a maximum range of 3,000 miles, and able to carry an 8-ton load, the Lancaster has a generally high performance. It dives at 360 m.p.h. and, when fully loaded, can climb at a rate of 1,000 ft. per minute.

**RECOGNITION:** Long boxy fuselage has prominent turrets on nose and tail, bulbous top turret and inconspicuous remotely controlled belly turret. The wing has straight section to inboard nacelles, tapers outboard to round tips. Dihedral starts from inboard engines. Tailplane is long and narrow; fins and rudders form long ovals. "Lank" usually has four Merlin inline engines, but may have four Bristol Hercules radials. Span, 102 ft.; length, 69½ ft.

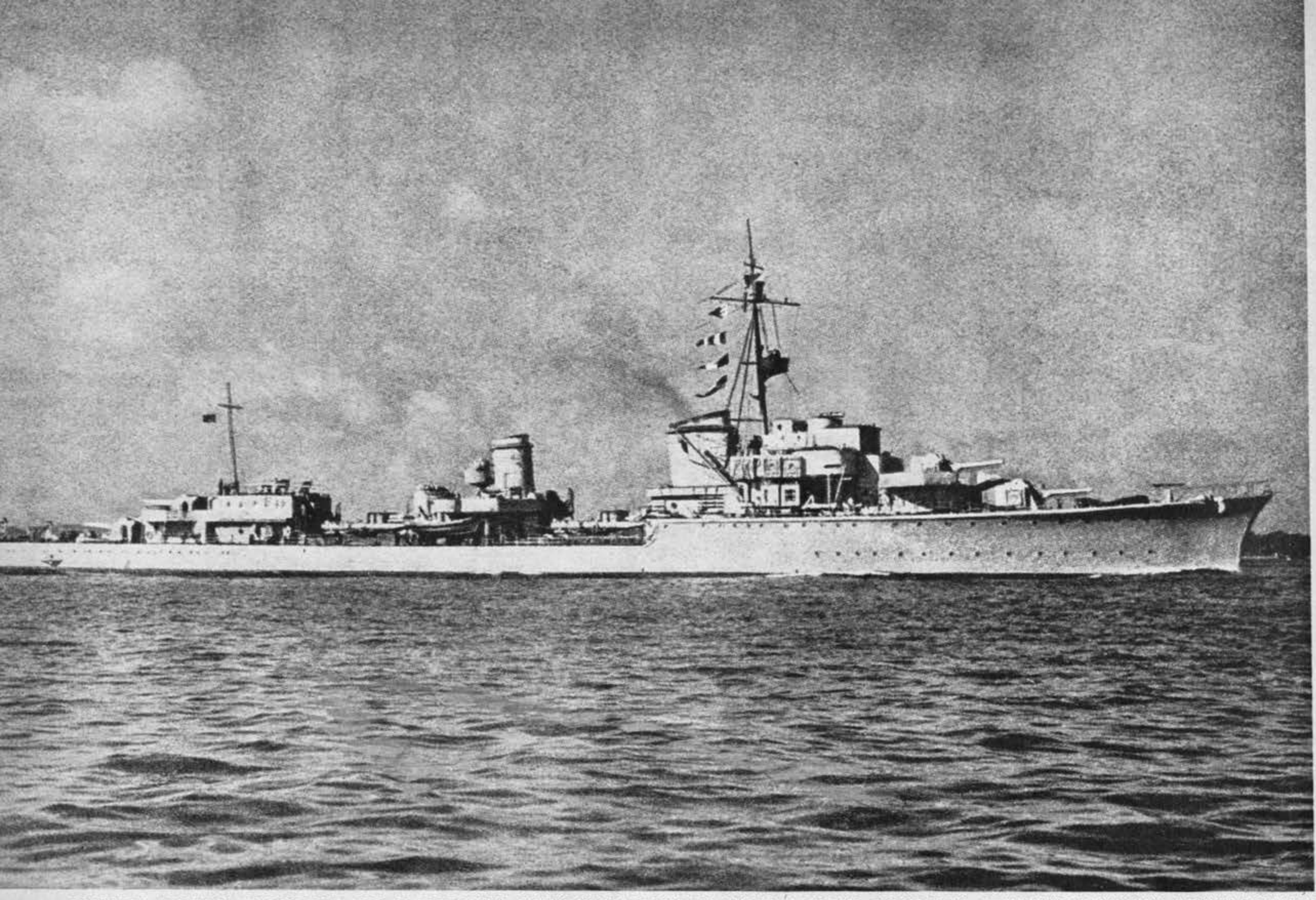


**LEADING EDGE TAPER DISAPPEARS** in this view of Lancaster but graceful lines of the wing remain, with straight section inboard. Inboard nacelles are longer and project farther forward. Fins are very tall.





**Above fire and flak of Hamburg broad-winged Lancaster looses tons of bombs on U-boat yards**

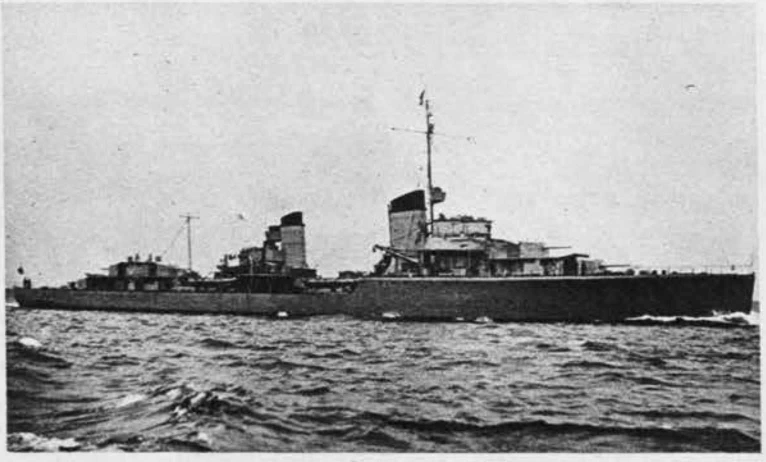


POWERFUL NARVIK CLASS DESTROYER CAN BE RECOGNIZED BY THE HEAVY FORESTACK, TRIPOD MAST AND CLIPPER BOW. SOME UNITS HAVE TWIN MOUNTS FORWARD

# CHANNEL CRAFT

## With heavier classes crippled, German Fleet's sting depends on smaller types

Two sharp displays of naval action coming within a few days of each other brought out clearly the situation of German sea might. The Scharnhorst, a fast but undergunned battleship of 26,000 tons, was sunk off North Cape, leaving the Nazi Navy without a single battleship in fighting trim. Three days later eleven Narvik and Elbing Class destroyers were sighted west of the Bay of Biscay, evidently seeking to contact an important blockade runner. Aircraft of RAF's Coastal Command had already accounted for the merchantman, and a U. S. Navy Liberator sighted the destroyer squadron in time to call in the British cruisers Glasgow and Enterprise. Expert British gunnery sank three of the German destroyers and damaged several others.



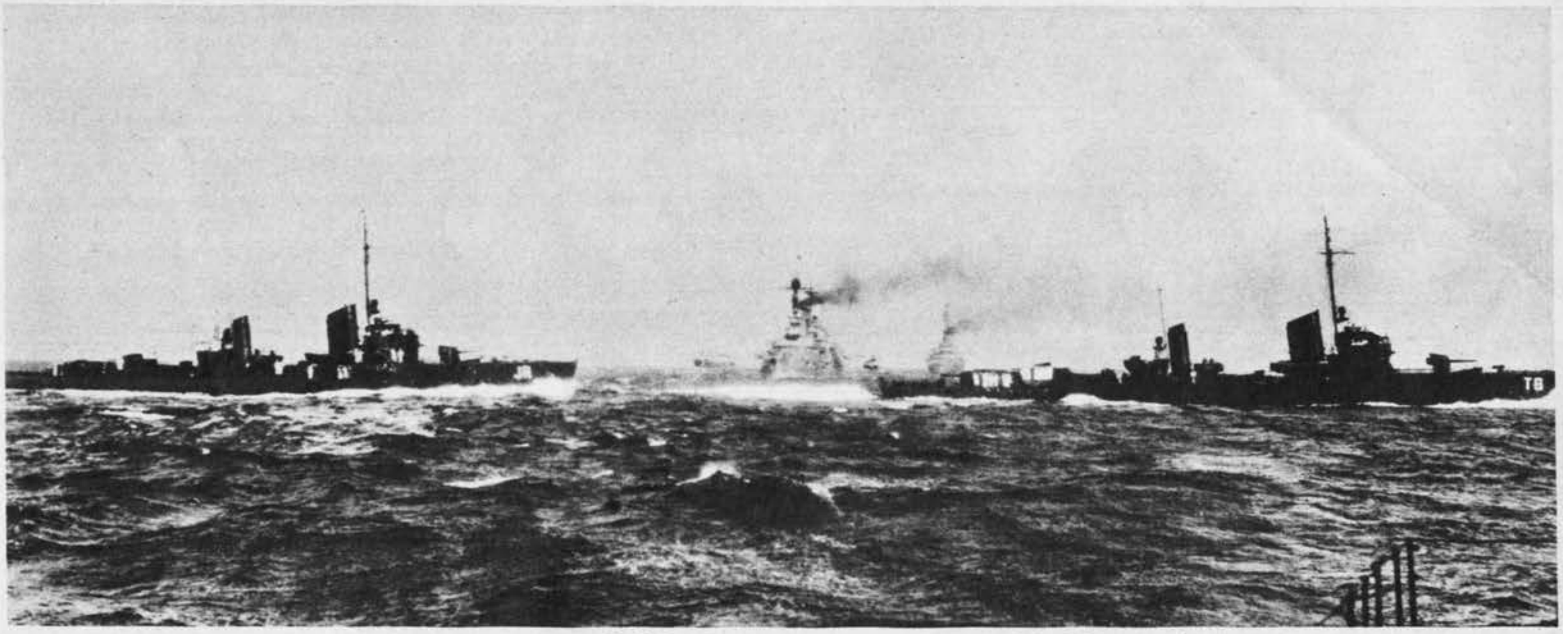
**MAASZ** was typical prewar Nazi destroyer. Note how widely-spaced stacks, with heavier one forward, break in deckline correspond with similar features on the Narvik Class DD shown above. Maasz's bow differs, however.

But these losses are no indication that the coastal sniping between German and Anglo-American sea and air forces will subside. As long as Nazi convoys slink from port to port in the English Channel and North Sea, planes of the RAF and ships of the Royal Navy's coastal forces will be out to attack them.

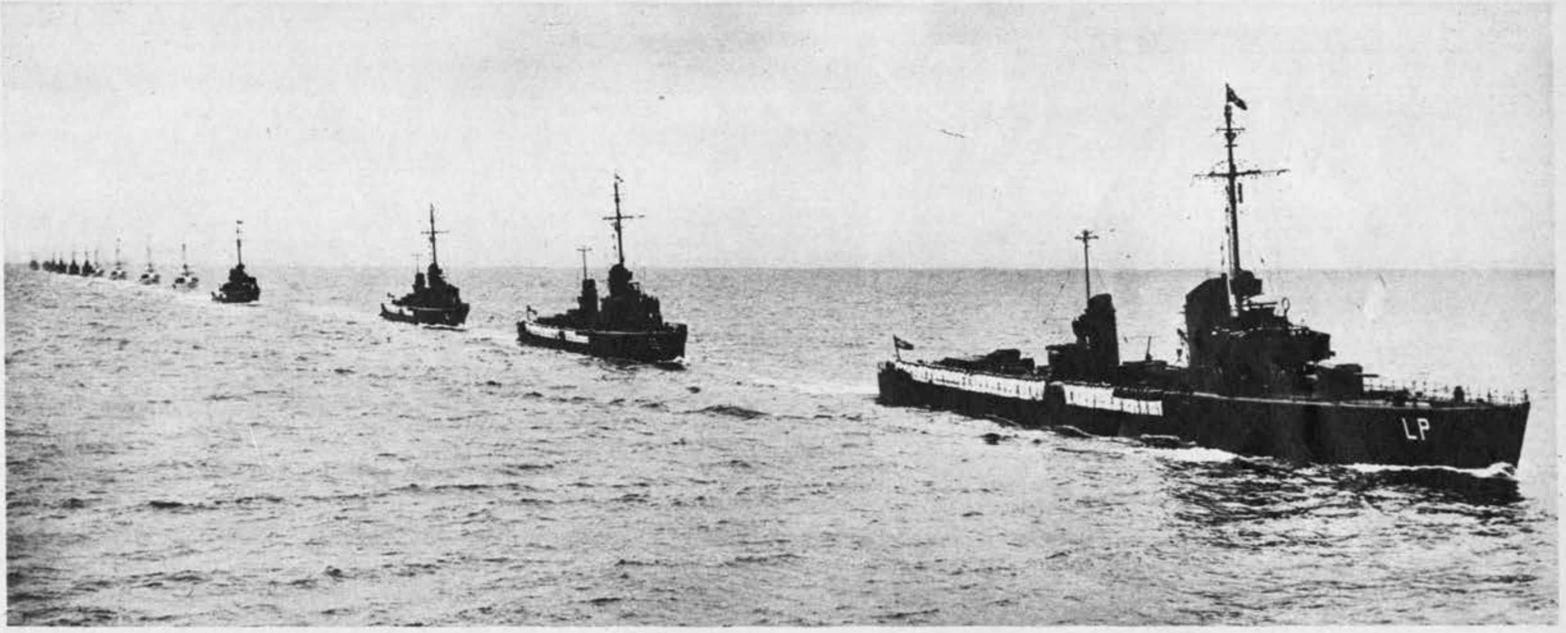
Most powerful destroyers of the German Fleet are the Narvik Class. Their four 5.9-in. guns enable them to engage light cruisers, have caused the Germans to call them convoy destroyers. They were laid down in 1939 and were first seen off Narvik. Newer than the Narviks but less heavily armed are the flushdeck Elbings (*see grid, pages 26–27*). They were laid down in 1942, got provisional class name when they were first identified off the East Prussian coast near Elbing. Except for the Karl Galster, lone survivor of the Roeder Class virtually wiped out at Narvik, the remaining German-built DD's belong to the Maasz Class laid down in 1935. Displacing 1,625 tons, and 381 ft. long, they are less formidable than the Narviks which measure 410 ft. in length, displace 1,870 tons.

Although destroyers have largely replaced torpedo boats in other navies, the Germans in the 1920's built the Möwe and Wolf Classes (*see opposite*). Since the Narvik, Roeder, Maasz, Wolf and Möwe Classes are somewhat similar in appearance, they appear on the training list as one group. Another class of torpedo boat, T-1's, were completed between 1938–40.

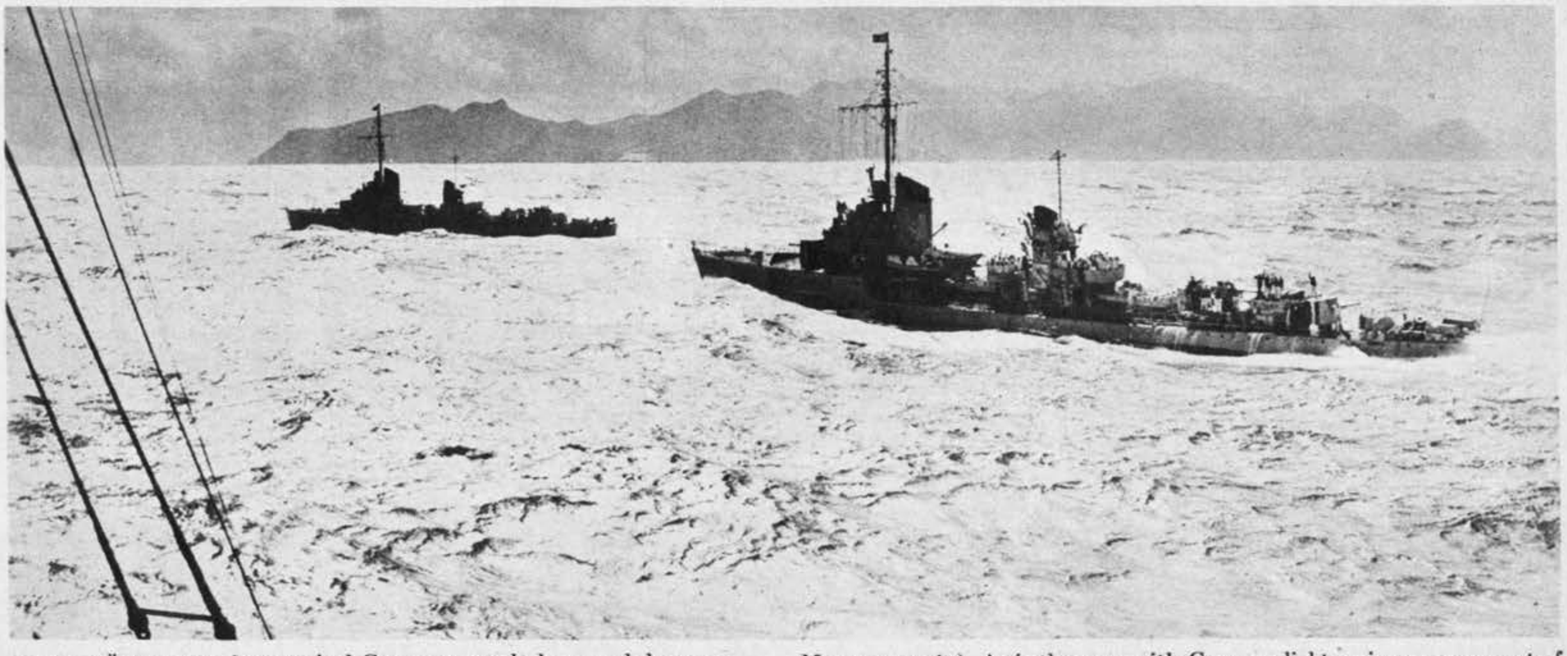
The balance of German minor combatant types and auxiliaries follow the conventional pattern of PT boats (S-boats), various types of minesweeping, minelaying craft, patrol boats, trawlers. The more important types are pictured on pages 24–25, while the German Navy as a whole, including seizures, is shown to scale on the grid which follows.



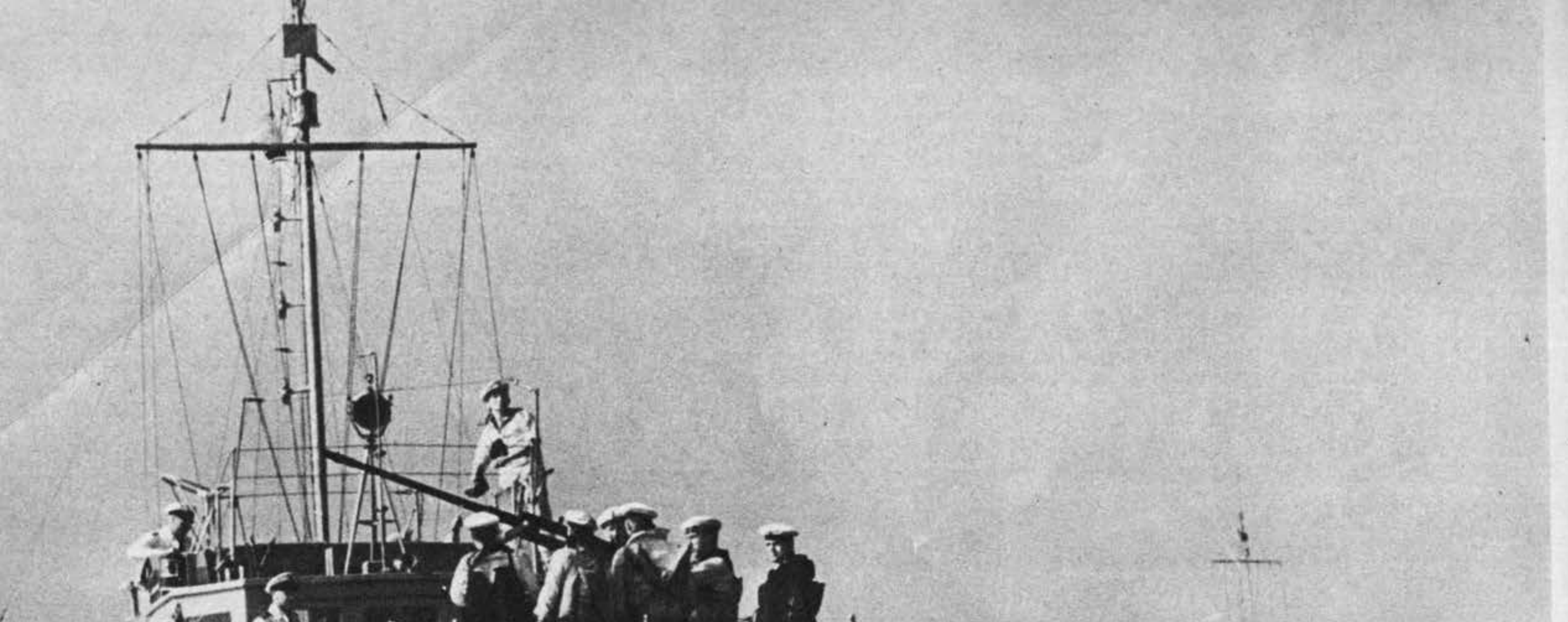
**WOLF CLASS TORPEDO BOATS** Jaguar and Tiger cross the T of old battleships Hessen and Schleswig-Holstein during Baltic maneuvers. Built as destroyers under limitations of the Versailles Treaty, these 800-ton ships are seaworthy enough for high seas duty with the Fleet. Their speed is 34 knots; armament includes three 4.1-in. guns, six 21-in. torpedo tubes in triple mounts. All of the Wolf Class ships are named for animals of prey.



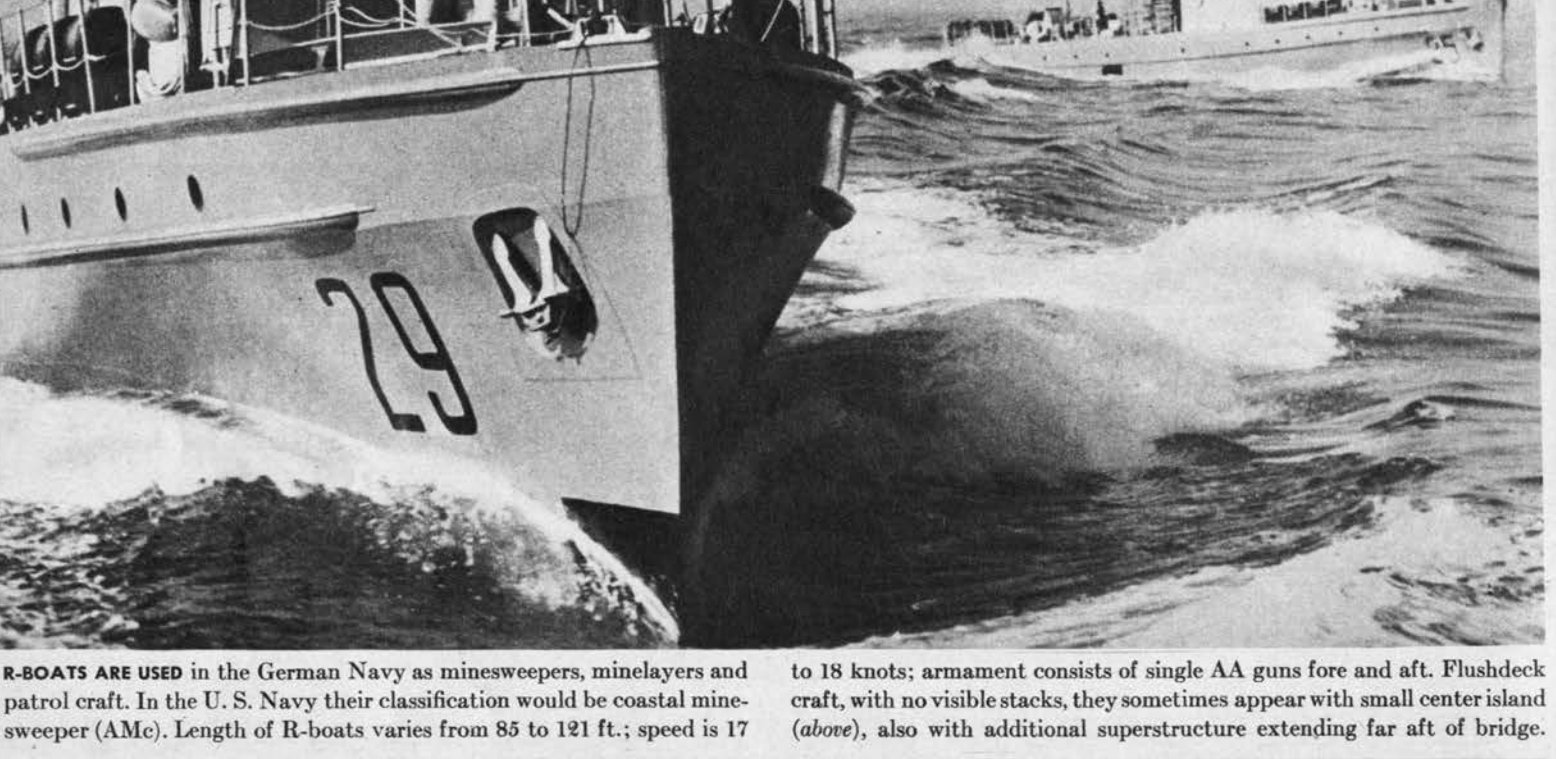
**MÖWE CLASS TB SEEADLER** (Sea Eagle) follows Leopard of Wolf Class in reviews at Kiel. Laid down in 1925, two years earlier than Wolf Class ships, the Möwes are slightly shorter (288 ft. vs. 304 ft.), displace same tonnage. Möwe means gull, and all ships in this class are named for birds. Distinguishing Möwe and Wolf ships from each other is difficult; Möwe's stack is set close to the bridge, both have raked rather than clipper bows.



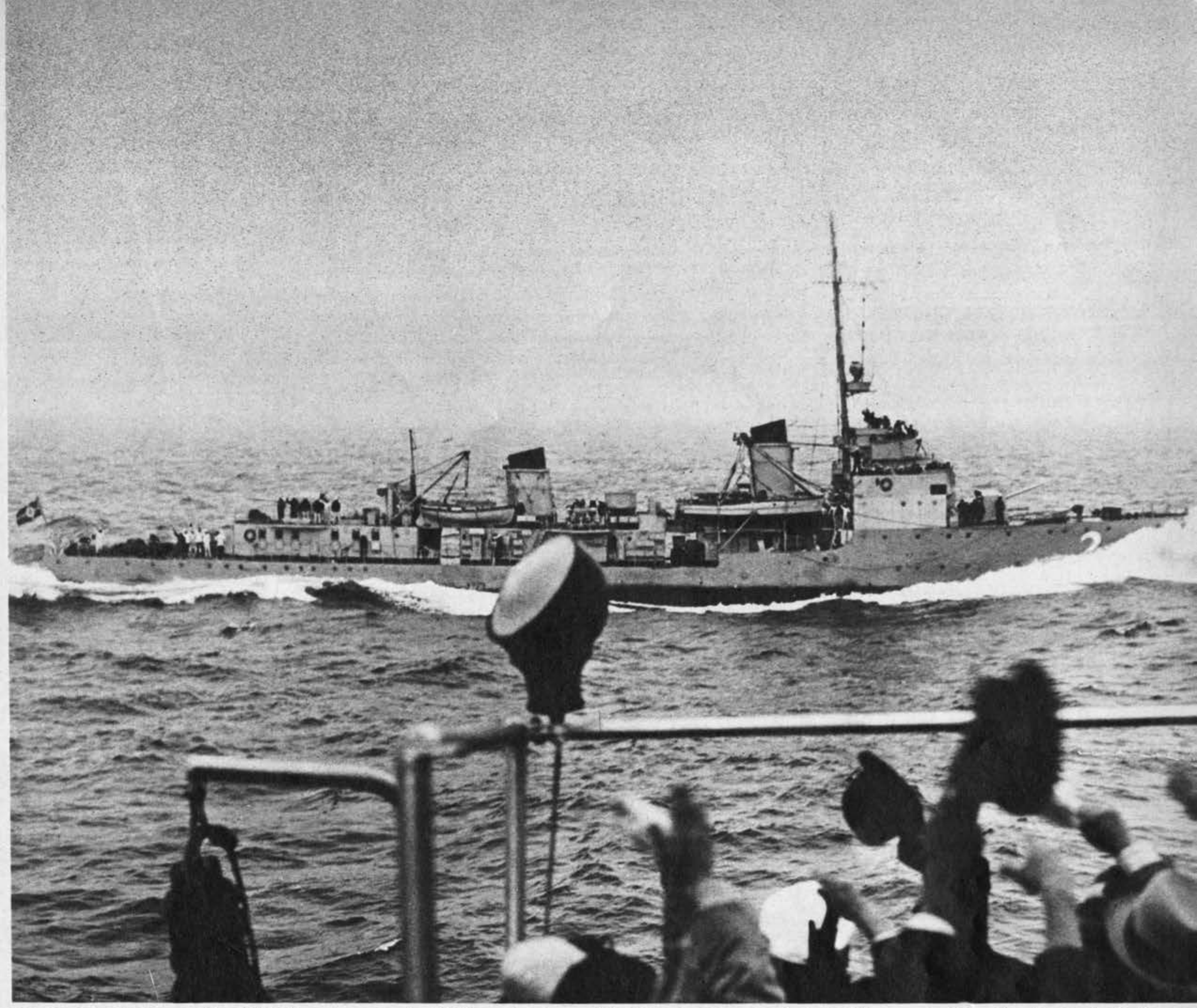
**TB'S OF MÖWE CLASS** show typical German torpedo-boat and destroyer design. They carry two stacks widely spaced with the heavier one forward. Break in deckline comes abreast of the forestack (*see Narvik and Maasz opposite*). As is the case with German light cruisers, armament of TB's is concentrated at the rear, indicating use of hit-and-run tactics. T-1 Class (*see grid*) is smaller, faster, less heavily armed than Wolf and Möwe.



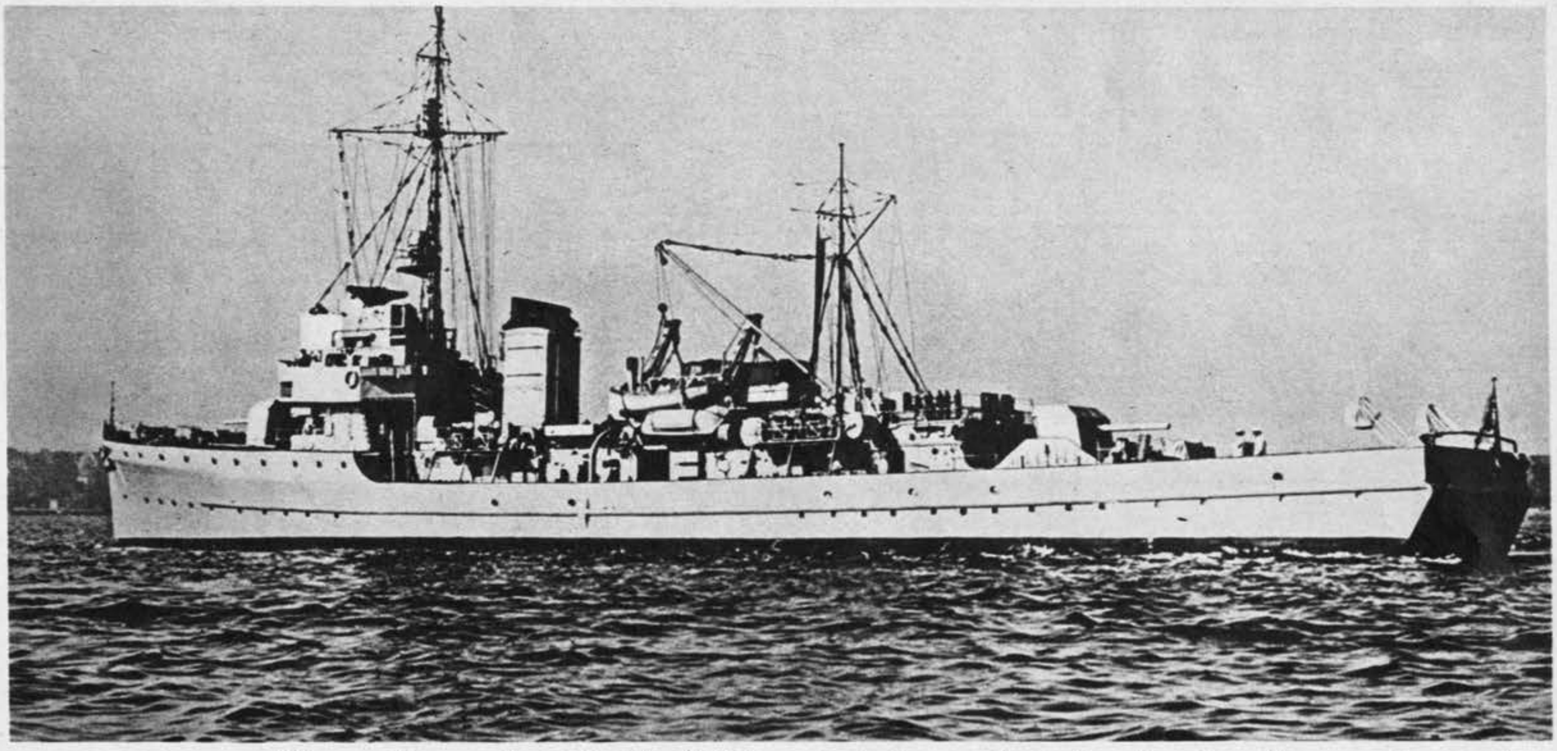
**R-BOATS ARE USED** in the German Navy as minesweepers, minelayers and patrol craft. In the U. S. Navy their classification would be coastal minesweeper (AMc). Length of R-boats varies from 85 to 121 ft.; speed is 17 to 18 knots; armament consists of single AA guns fore and aft. Flushdeck craft, with no visible stacks, they sometimes appear with small center island (*above*), also with additional superstructure extending far aft of bridge.



**OFFENSIVE THREAT** in the English Channel is supplied by torpedo-carrying S-boats which frequently attack British forces. The known types have lengths of 92, 106, and 115 ft. They are bigger than U. S. PT's, though they are slower. The longest S-boat Class carries mines in addition to its two torpedo tubes. The tubes can be seen externally on the type shown above; on other S types they are built into the top of the hull near bow.



**MINELAYING GUNBOATS,** units of F-1 Class, have seen but little service to date. Their armament consists of single 4.1-in. guns fore and aft, also four 1.460-in. AA guns. Except for flushdeck Königin Luise (F-3), ships of F-1 Class have two breaks in deckline, one just fore, the other just aft of forestack. Length of the F-1's is approximately 250 ft., displacement 600 tons. Widely-spaced stacks and high freeboard forward aid identification.



**STANDARD MINESWEEPERS** of German Navy are the 215-ft. ships of M-1 Class. Escorting convoys and subs in Bay of Biscay, they seek to counteract minelaying campaign of RAF's Coastal Command. Class included 40 units, has been cut sharply through war losses. Tonnage and armament are approximately same as F-1's. Outstanding recognition features are barge-like stern, high boat davits amidships (*here shown lowered*), and single stack.

# GERMAN NAVAL VESSELS

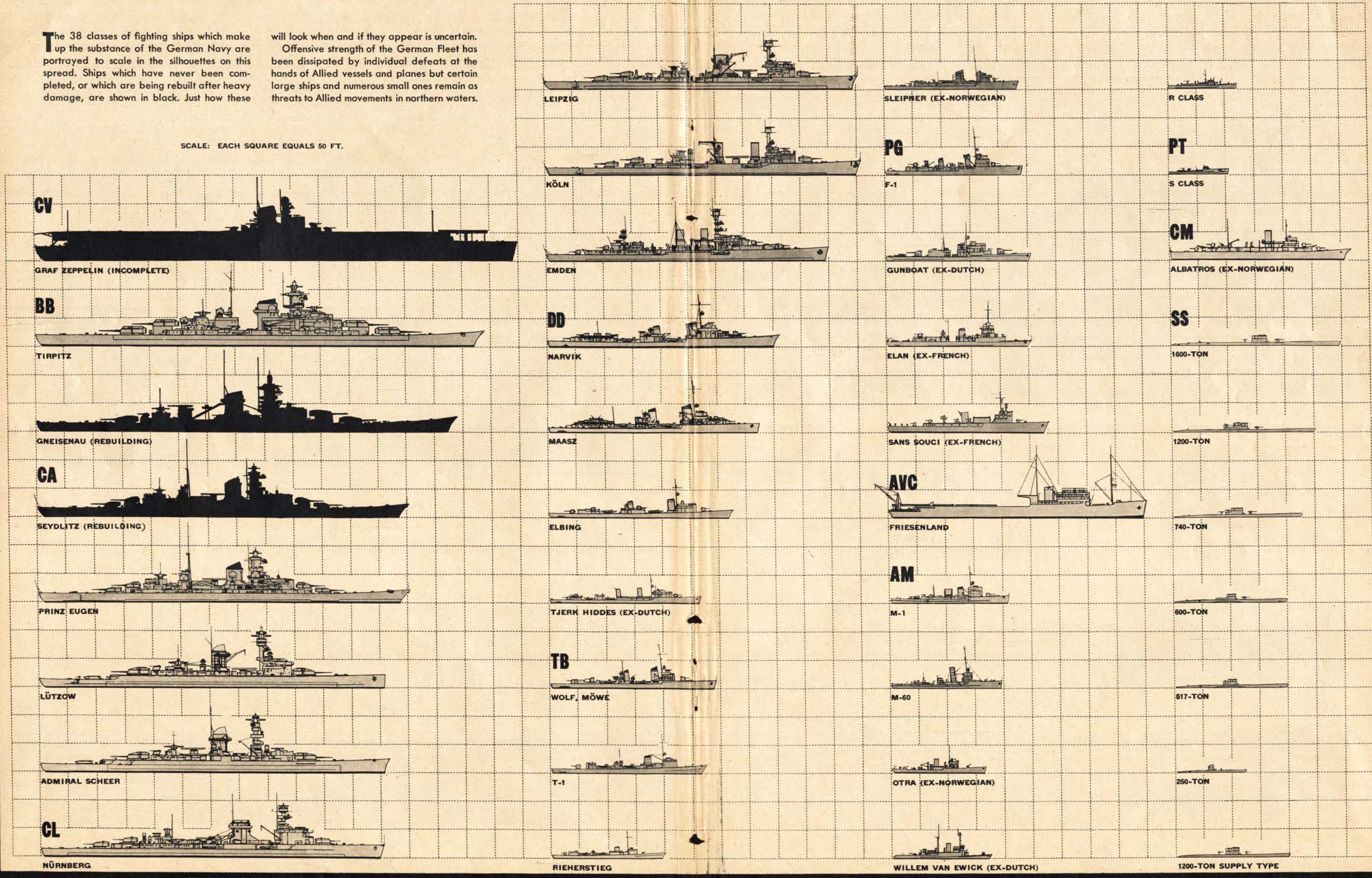
## PRINCIPAL COMBATANT TYPES BY CLASSES

RESTRICTED

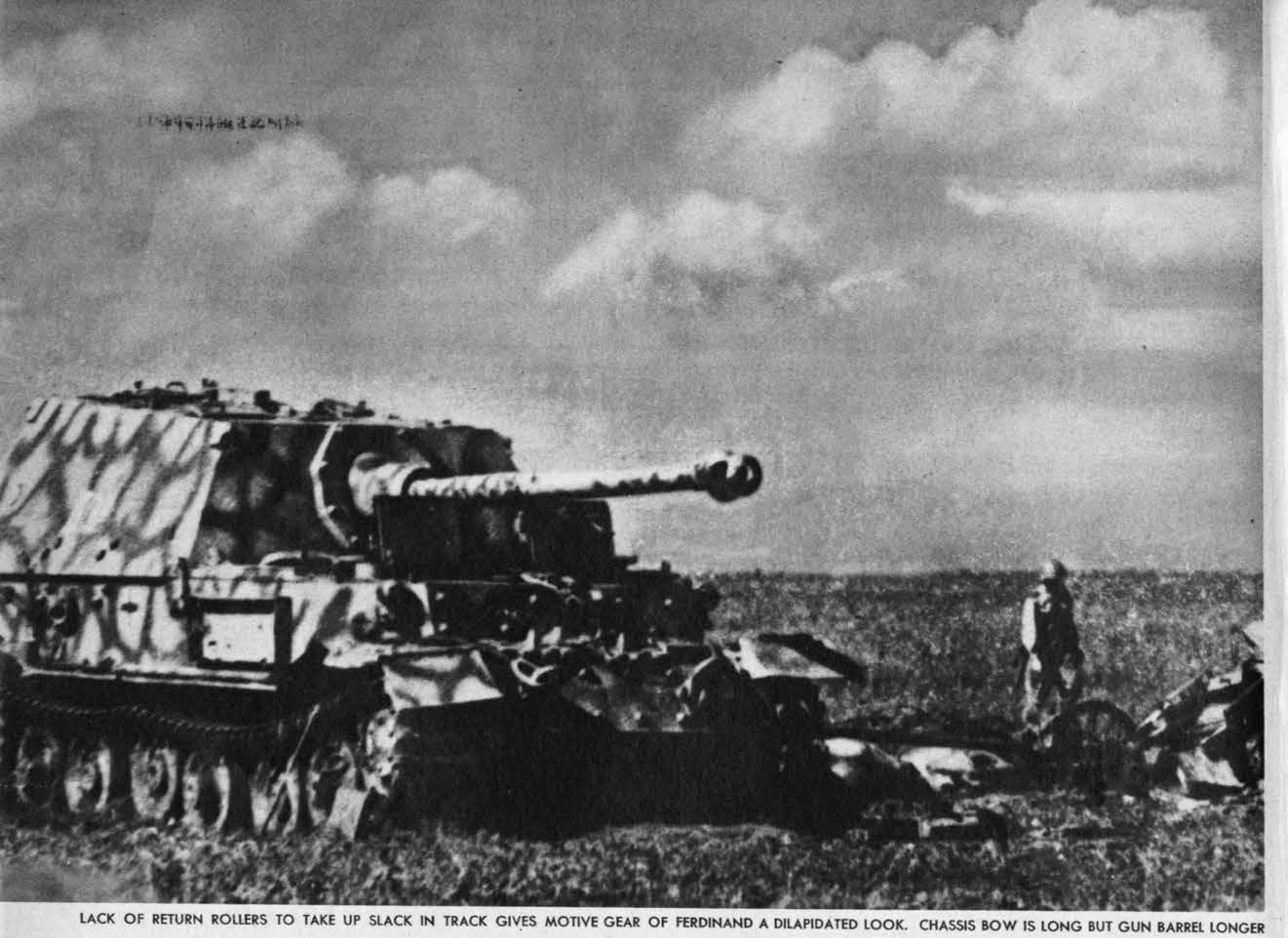
The 38 classes of fighting ships which make up the substance of the German Navy are portrayed to scale in the silhouettes on this spread. Ships which have never been completed, or which are being rebuilt after heavy damage, are shown in black. Just how these will look when and if they appear is uncertain.

Offensive strength of the German Fleet has been dissipated by individual defeats at the hands of Allied vessels and planes but certain large ships and numerous small ones remain as threats to Allied movements in northern waters.

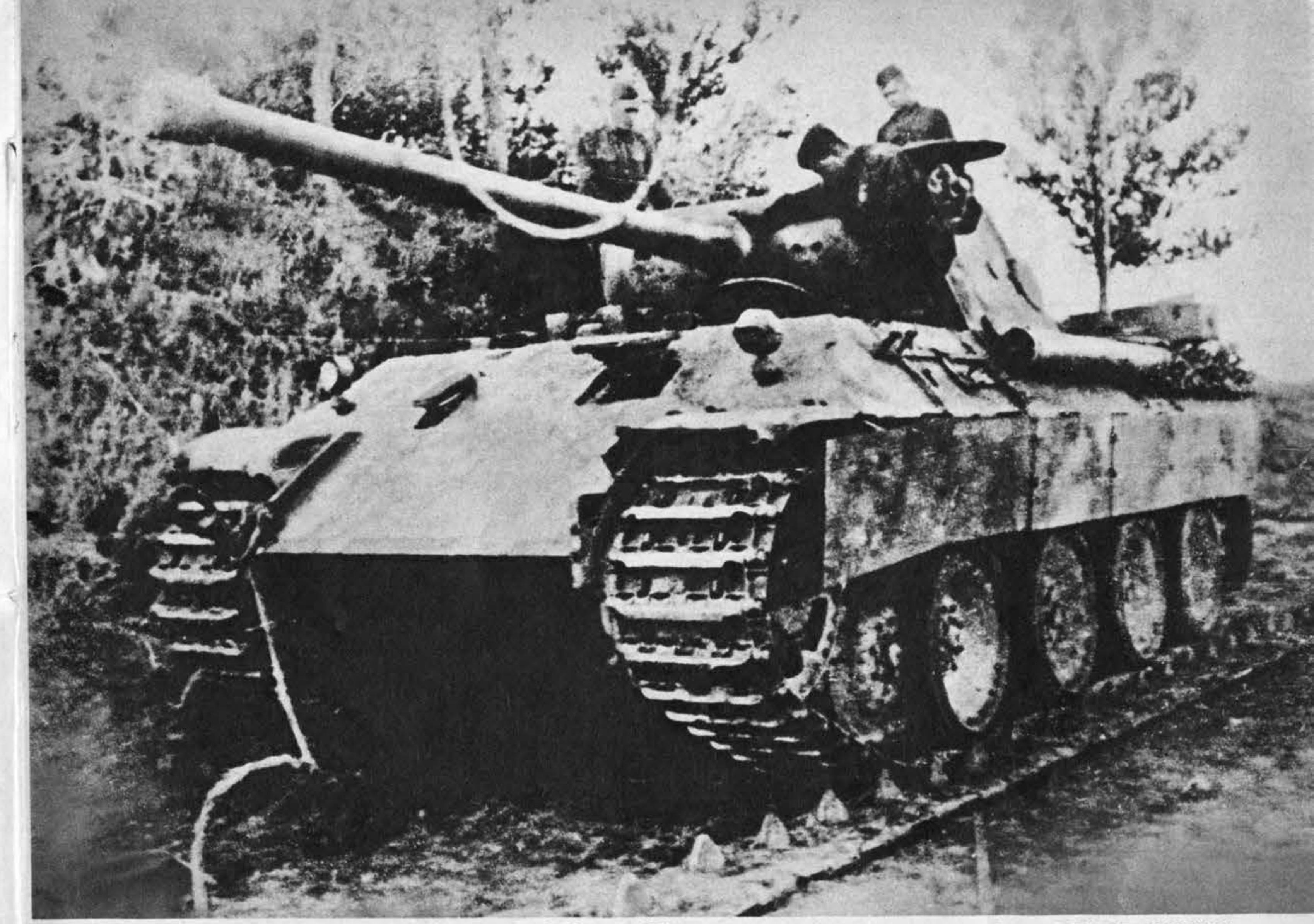
SCALE: EACH SQUARE EQUALS 50 FT.


CV
GRAF ZEPPELIN (INCOMPLETE)
BB
TIRPITZ
GNEISENAU (REBUILDING)
CA
SEYDLITZ (REBUILDING)
PRINZ EUGEN
LÜTZOW
ADMIRAL SCHEER
CL
NÜRNBERG
LEIPZIG
KÖLN
EMDEN
DD
NARVIK
MAASZ
ELBING
TJERK HIDDES (EX-DUTCH)
TB
WOLF, MÖWE
T-1
RIEHERSTIEG
SLEIPNER (EX-NORWEGIAN)
PG
F-1
GUNBOAT (EX-DUTCH)
ELAN (EX-FRENCH)
SANS SOUCI (EX-FRENCH)
AVC
FRIESENLAND
AM
M-1
M-60
OTRA (EX-NORWEGIAN)
WILLEM VAN EWICK (EX-DUTCH)
R CLASS
PT
S CLASS
CM
ALBATROS (EX-NORWEGIAN)
SS
1600-TON
1200-TON
740-TON
600-TON
517-TON
250-TON
1200-TON SUPPLY TYPE

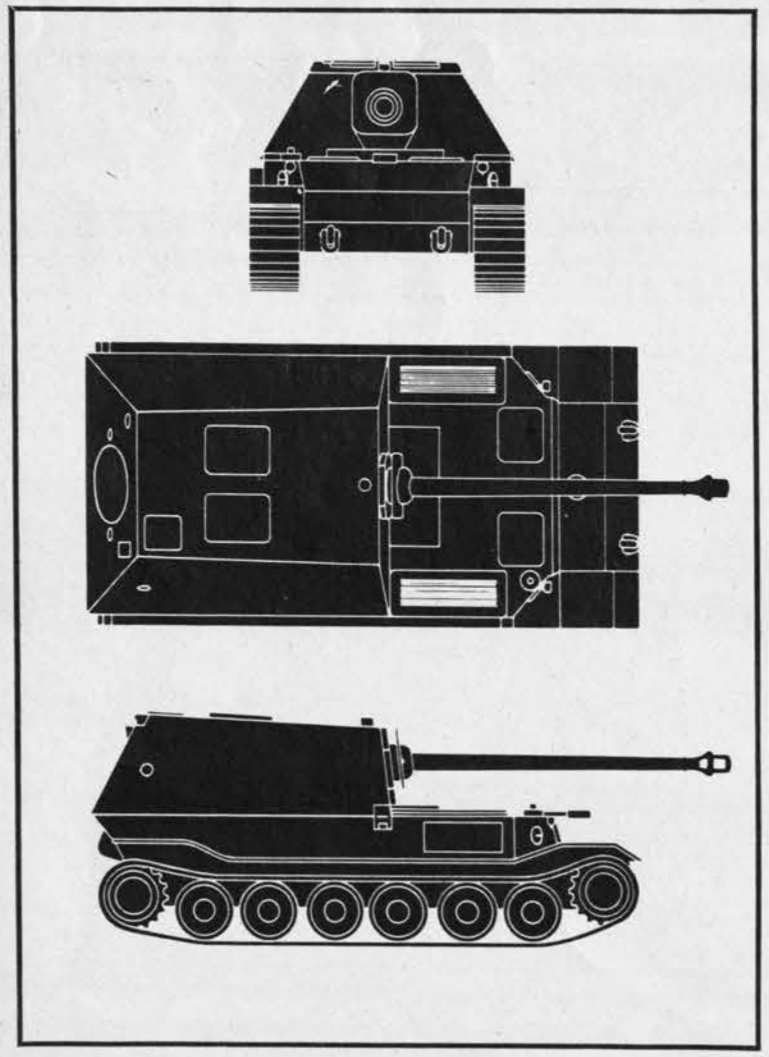
DIVISION OF NAVAL INTELLIGENCE—IDENTIFICATION AND CHARACTERISTICS SECTION—JANUARY 1944



LACK OF RETURN ROLLERS TO TAKE UP SLACK IN TRACK GIVES MOTIVE GEAR OF FERDINAND A DILAPIDATED LOOK. CHASSIS BOW IS LONG BUT GUN BARREL LONGER



HUGE BOW OF PANTHER SLOPES UP TO IMPOSING HEIGHT. TURRET HAS ROUNDED FORWARD WALL RESEMBLING RUSSIAN T-34. ARMOR PLATE PROTECTS SUSPENSION



# FERDINAND & THE PANTHER

## More pictures of self-propelled "88" and PzKw Mark V reveal details of new Nazi weapons

The Germans have been hurling their heaviest armored equipment against the Russians. Recently silhouettes and more pictures of the two newest Nazi armored threats encountered on the Russian front, Ferdinand and the Panther (*see Journal Nov. and Dec.*), have been made available to the *Journal*, are shown on these two pages.

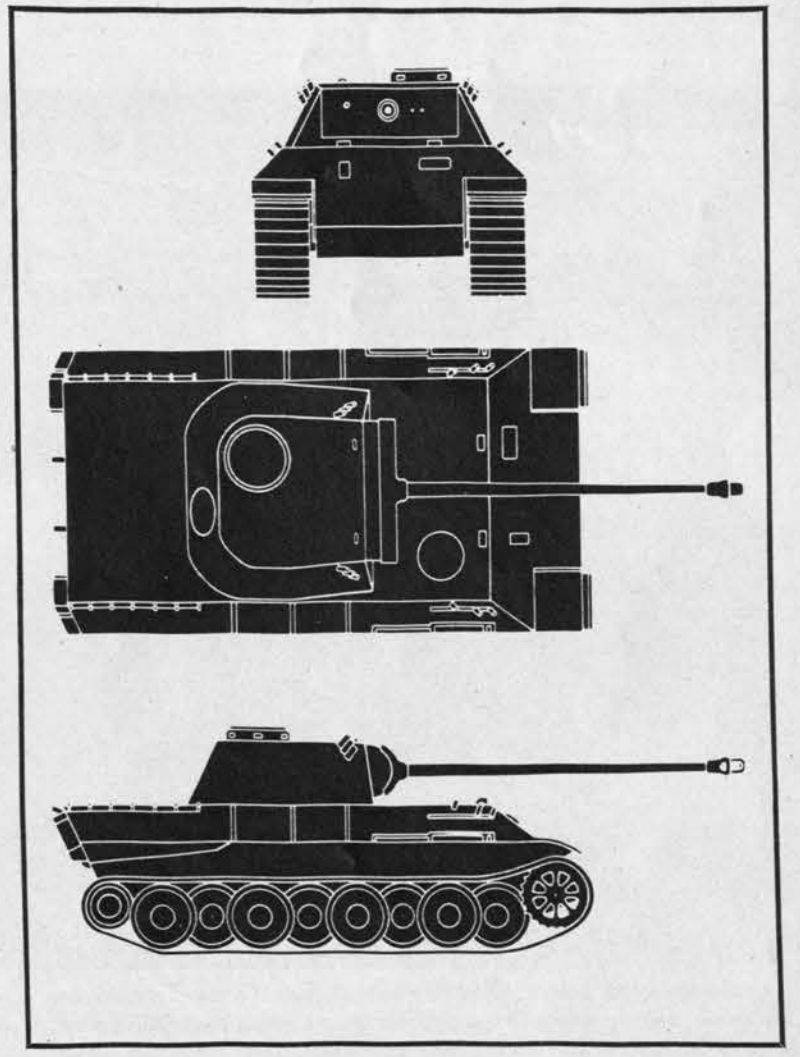
Ferdinand is a tremendous 70-ton self-propelled mount which carries an 88-mm. gun on a chassis built to offer maximum resistance to enemy firepower. The thickness of Ferdinand's armor plate is as much as 8 in. on the front, intended to make the mount serve as a battering ram to clear the way for lighter armored vehicles of the Nazi anti-tank battalions. There are usually 44 of these self-propelled "88's" in one heavy battalion and each one carries a crew of six. Although the mighty firepower and armor of Ferdinand make it a dangerous opponent, it has been proved to be quite vulnerable. Unwieldy and underpowered for its great size, it can travel only 12 m.p.h. on a highway and 6 to 9 m.p.h. on rough ground; to fire, it must come to a full stop. When Ferdinand is attacked by more than one opponent at a time, its fixed weapon is a great handicap. Russians concentrate their artillery attacks on Ferdinand's mobile parts which break down readily under the great weight of the chassis; also on the gun installation and on the gas tanks in the center of the hull. Grenades and Molotov cocktails hurled through a large shell-case ejection opening in the rear of the mount will blast the twin electric motors located directly inside.

A new heavy tank in the German arsenal, the 45-ton PzKw Mark V serves to bridge the gap between the 22-ton Mark IV and the 60-ton Mark VI, Tiger. This tank, which is called the Panther, appears to be a first-class vehicle, fast, well-armored and hard-hitting. It has the advantage of being swifter and more maneuverable than the Tiger but at the same time is easier to knock out because of lighter armor protection. Its long-barreled 75-mm. gun with double-baffle muzzle brake is a new weapon which has a high velocity, considerable armor penetration, and direct sights up to a distance of 1,640 yd.

Like the Tiger, the Panther can be converted for deep stream fording. It has a speed of 31 m.p.h. and carries a crew of five. Its heaviest armor plate, on the front of the turret and the cannon shield, is about 3.94 in. thick. The top and bottom of the tank are lightly armored and are especially vulnerable to grenade fire.

**RECOGNITION:** The huge coffinlike gunshield of Ferdinand, set well to rear, has sloping sides and top. Hull is rectangular and straight-sided. Six large evenly-spaced bogie wheels support a track approximately 2½ ft. wide.

The Panther is built close to the ground with a low center of gravity. Its turret sides flow in sloping line into the sides of the hull. The turret is slab-sided and set slightly to the rear of center with a cupola at the back. The 75-mm. gun barrel is extremely long. From the side, the Panther's hull is sharply undercut behind. Eight overlapping bogie wheels on each side with driving sprocket in front are typical of German-designed suspension systems.



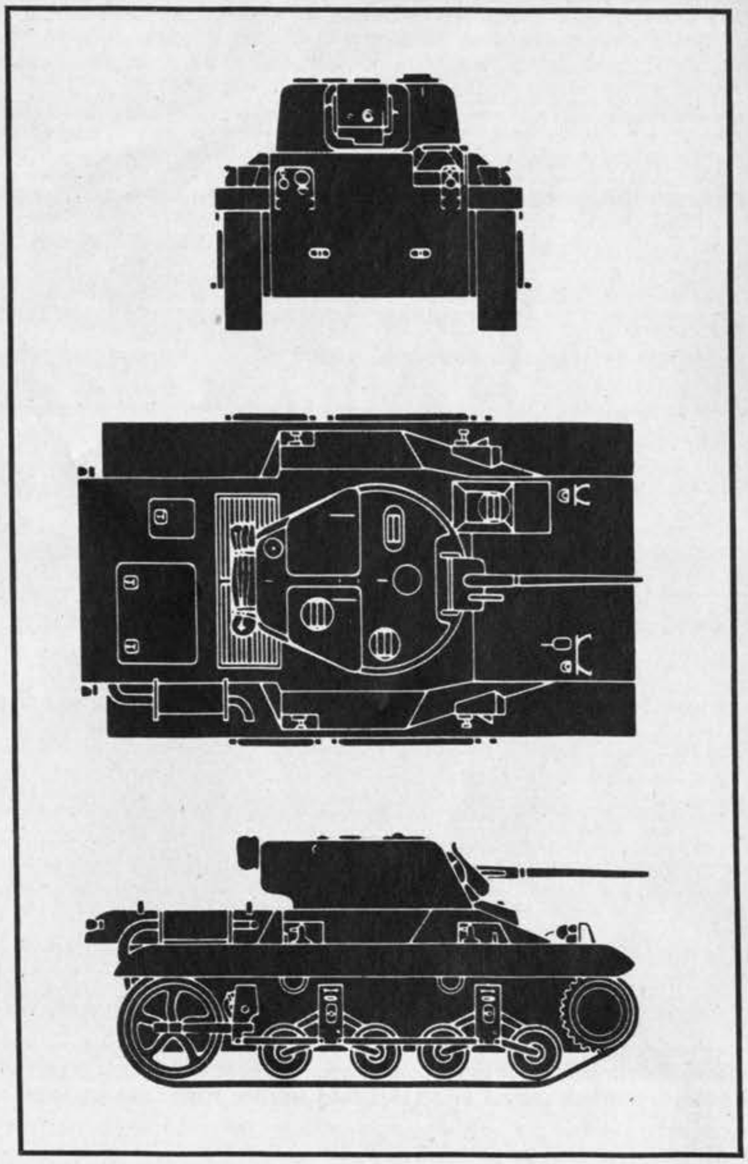
# ARMY'S FIRST AIRBORNE TANK

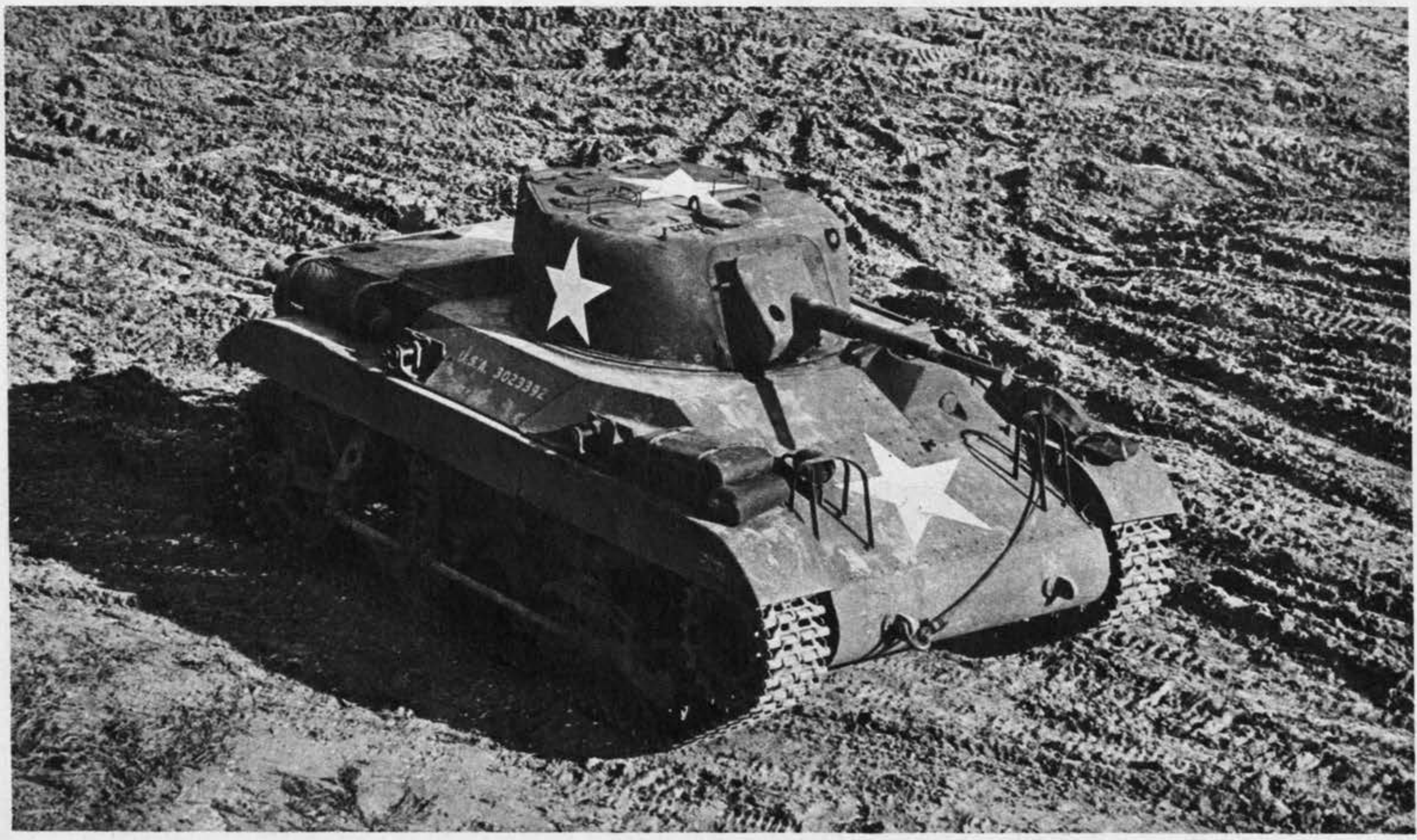
Airplanes in this war have carried all kinds of supplies, have ferried men and jeeps and field guns to the front lines. During the Papuan campaign alone the Army Air Forces Troop Carrier Command transported 12,000,000 lb. of equipment in less than 2½ months over the storm-swept ranges of the Owen-Stanley Mountains between Port Moresby and Buna Mission. One Flying Fortress ferried across a four-gun battery of 105-mm. howitzers.

Now, for the first time, the U. S. is prepared to transport armored vehicles by air. The Russians who were first to experiment with parachute-borne artillery have scarcely ever employed these tactics seriously. Even the Germans in their well-organized airborne invasions only occasionally have flown tanks to battle. But the U. S. Army's new T9E1, world's smallest four-man tank, has been specially designed to be airborne. It is a fast, light and maneuverable tank with many features in its construction which mark a departure from previous American design. Its 37-mm. gun has an angular rather than a circular mantlet. Hull sides are sloping rather than vertical and are covered with hooks and other gadgets. The usual tandem bogie wheels, in two pairs, have horizontal rods to keep them in place during transit.

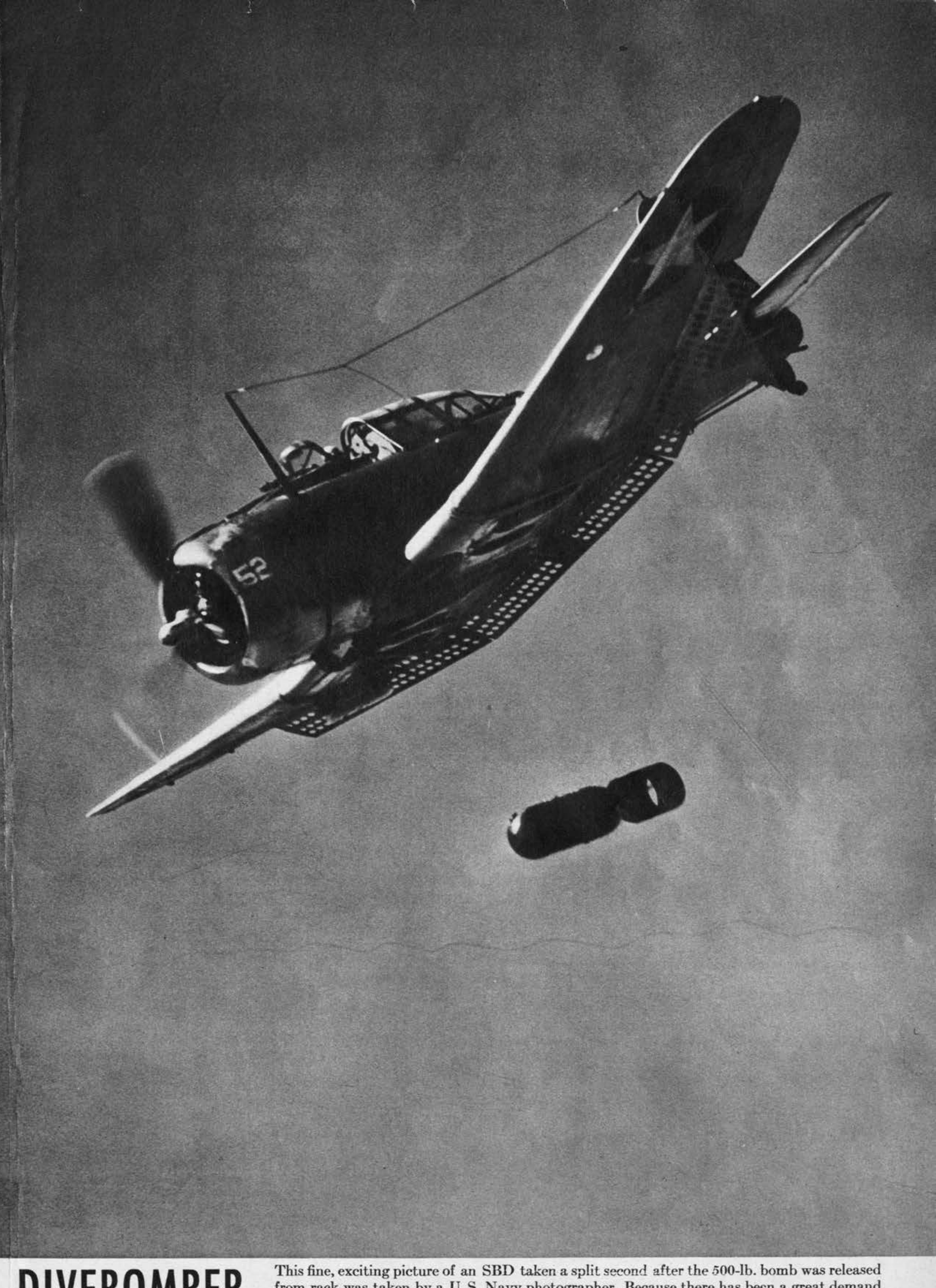
The total weight of the vehicle is only 7.9 tons; height is 5 ft. 9 in. Its armor plate averages less than an inch in thickness. Maximum speed is 40 m.p.h. and the tank has a cruising range of 135 miles.

**RECOGNITION:** From above, cast turret of the T9E1 forms a curve at front, then gradually tapers to a straight edge in rear. Sides of hull form an almost perfect rectangle except for the rear where a rounded extension overhangs the tracks. From the side the gun turret is undercut behind, slopes into the bow in front.





**A COMPACT VEHICLE,** the smallest four-man tank in the world should provide new striking power to our airborne troops. From the head-on view, the T9E1 has a deep curving belly and a distinctly low squat silhouette which affords very slight ground clearance. Its 37-mm. gun reaches the complete length of the front section, has an angular mantlet. All possible deadweight has been eliminated in the T9E1's suspension system.

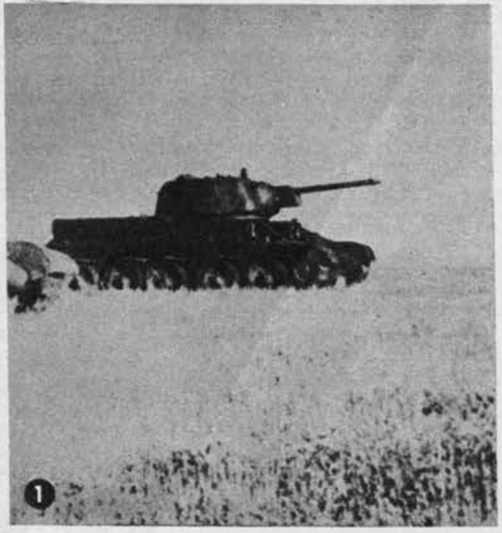


# DIVEBOMBER

This fine, exciting picture of an SBD taken a split second after the 500-lb. bomb was released from rack was taken by a U. S. Navy photographer. Because there has been a great demand for such pictures, the *Journal* will hereafter try to publish in each issue a Plane of the Month.

R #19

# QUIZ NO. 2: ARMORED COMBATANTS



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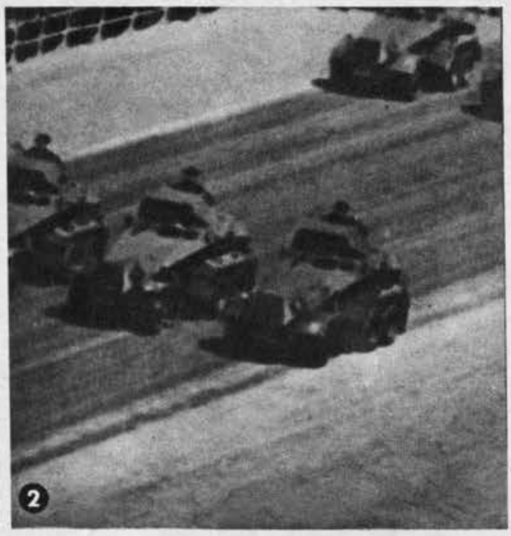

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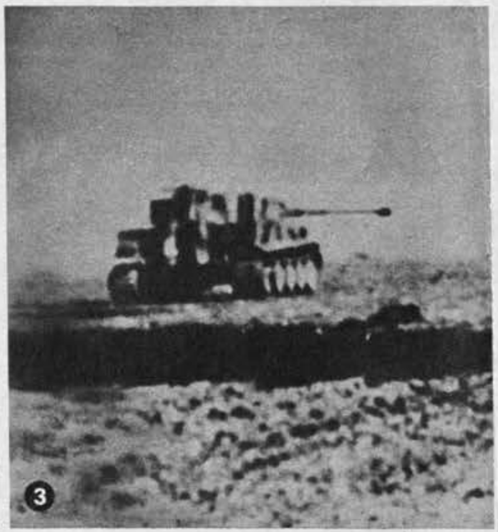

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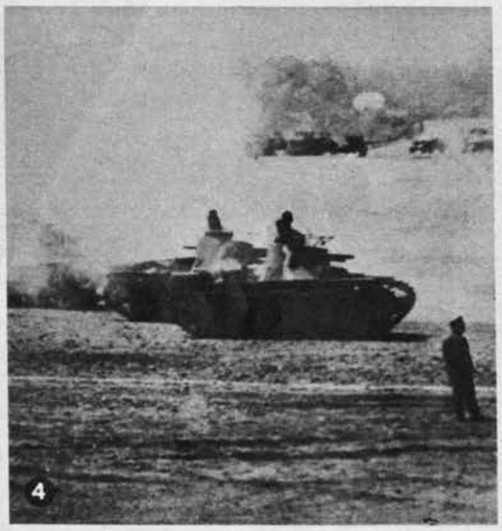

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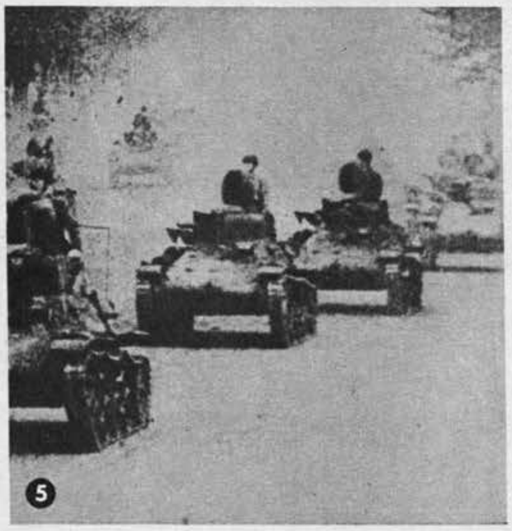

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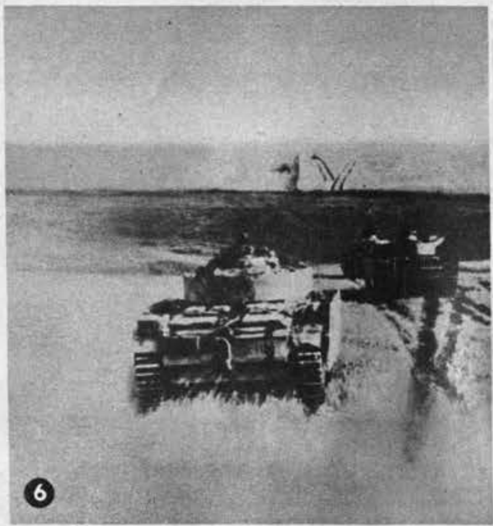

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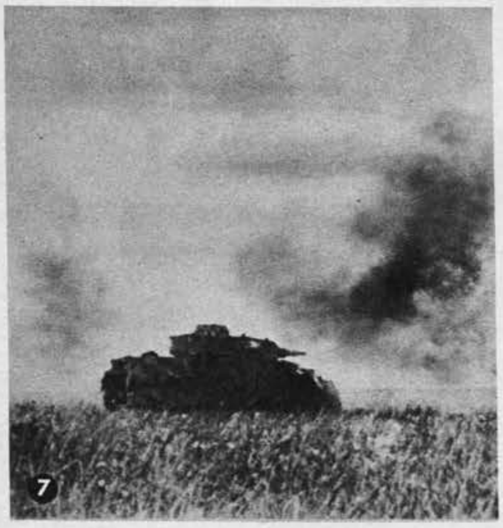

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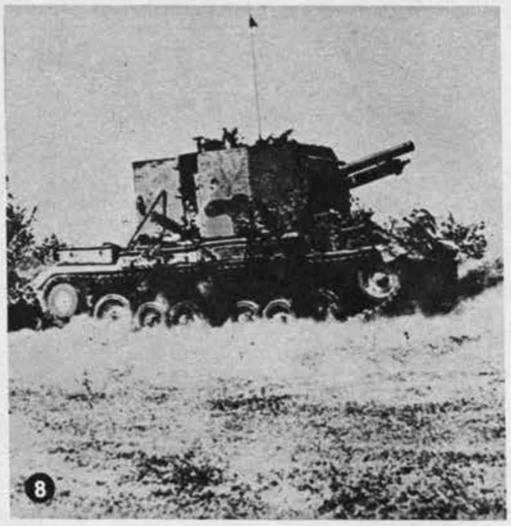

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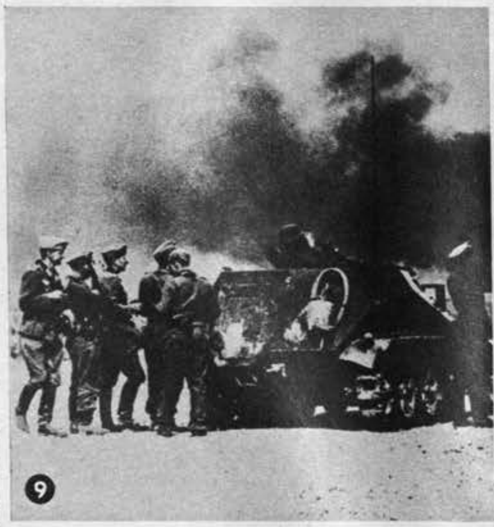

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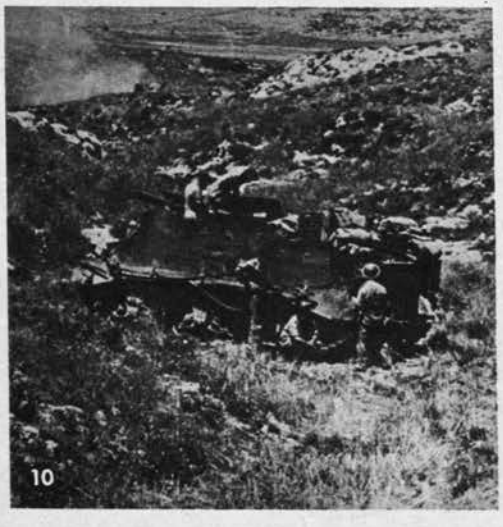

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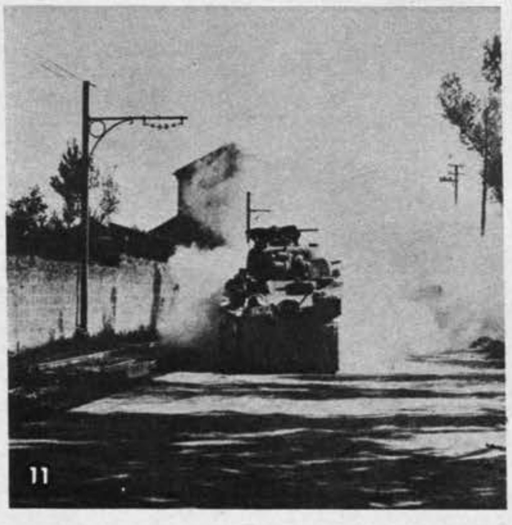

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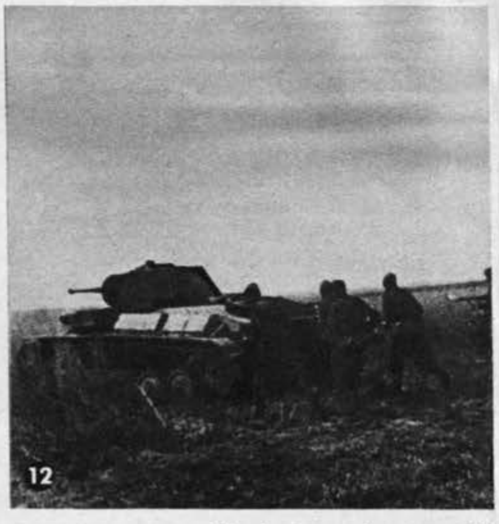
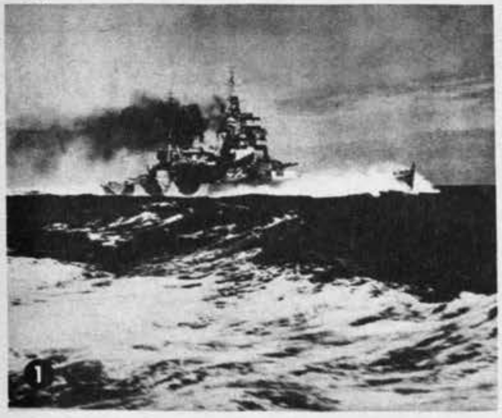


12

(For key to numbers, see p. 50)

# QUIZ NO. 3: IT TAKES ALL KINDS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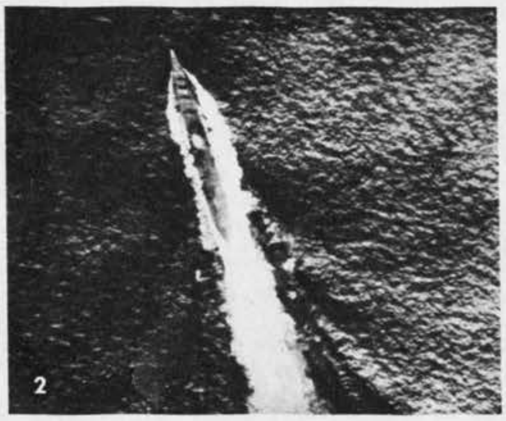
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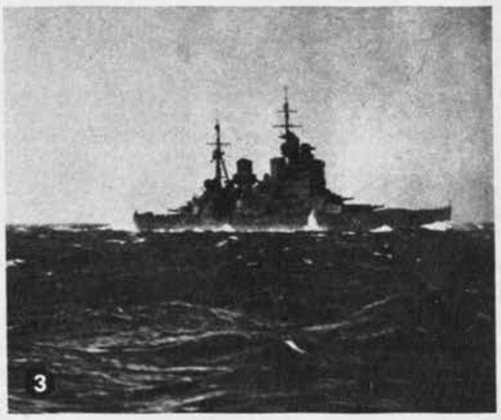
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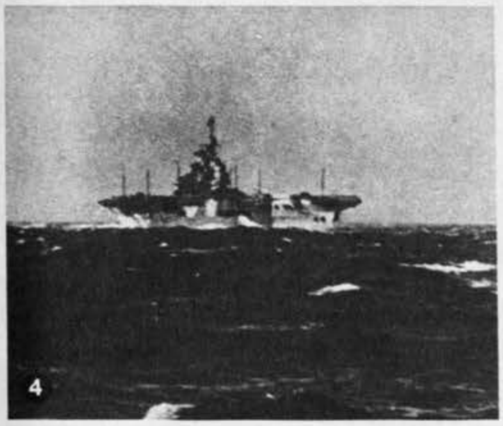
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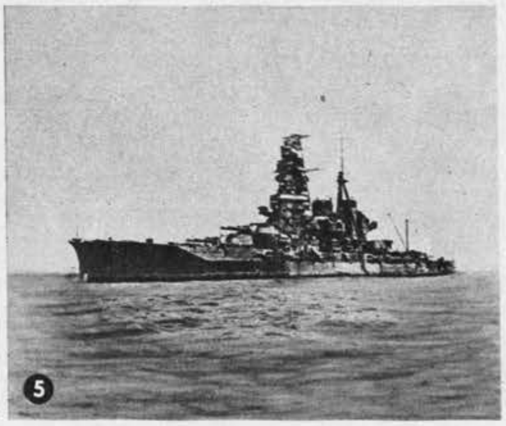
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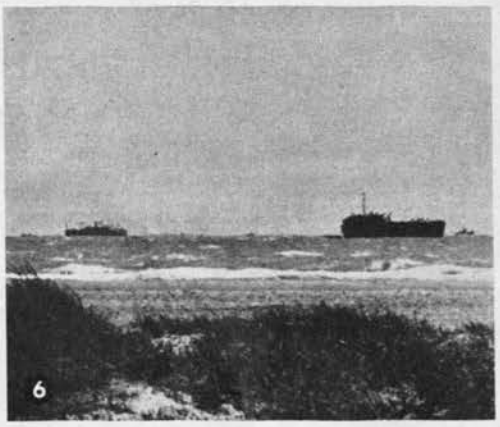
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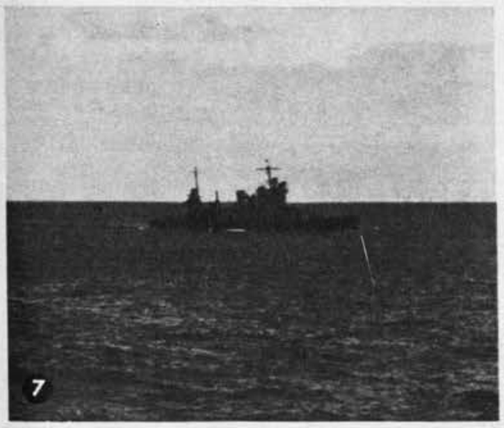
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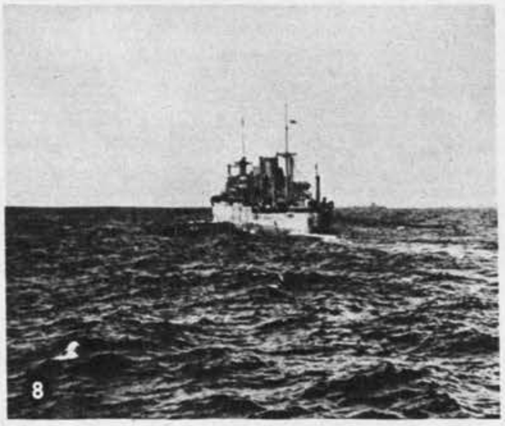
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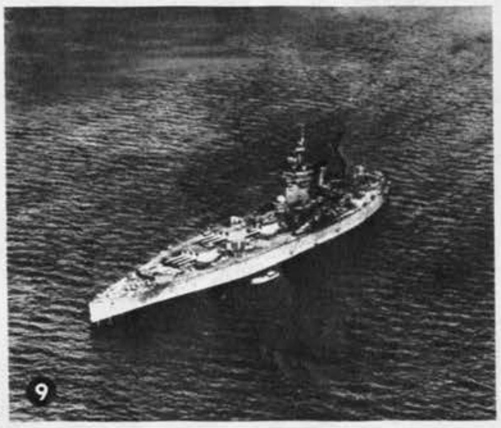
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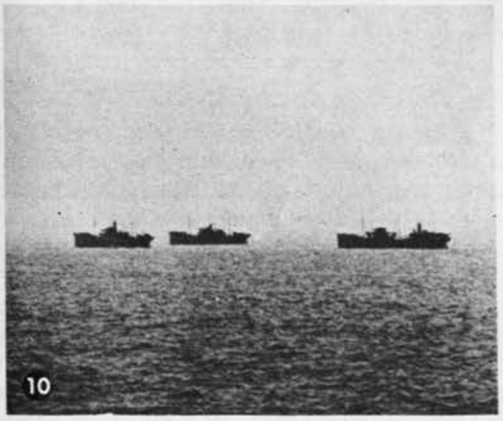
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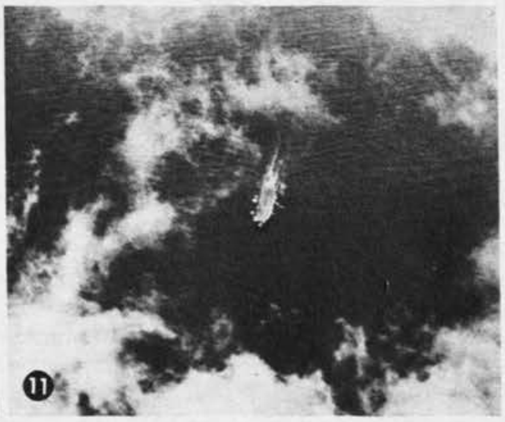
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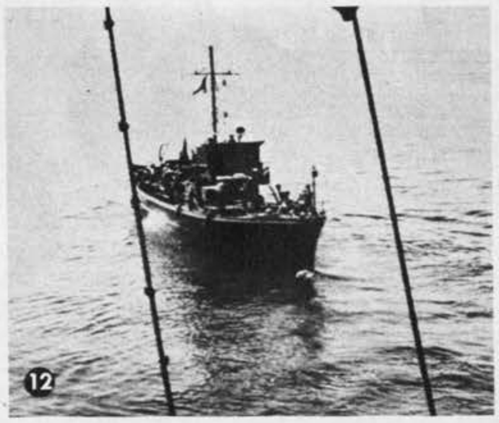
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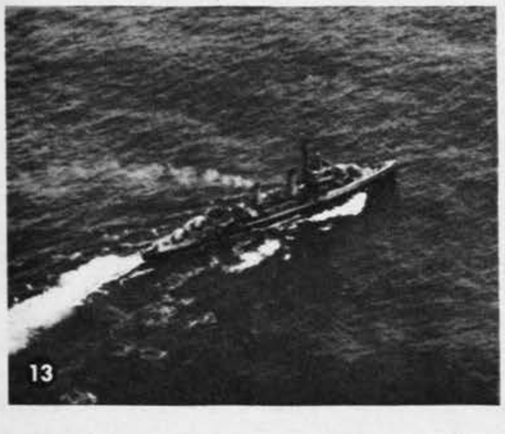
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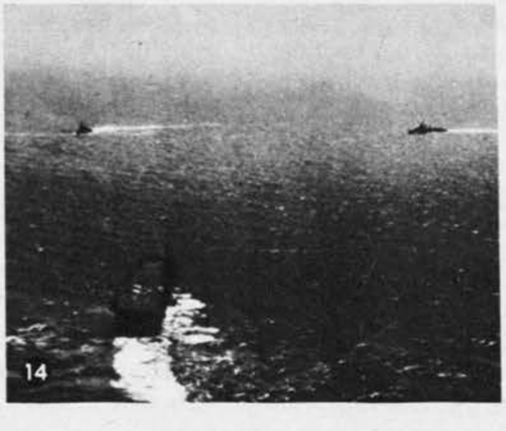
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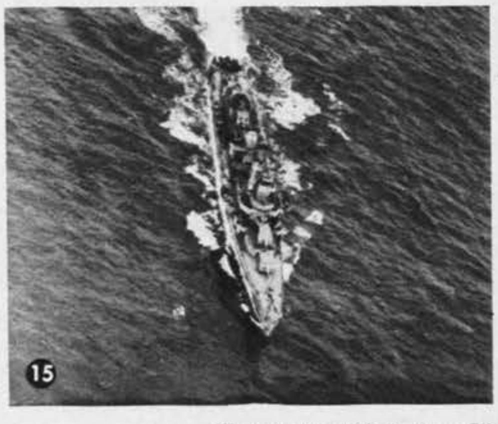
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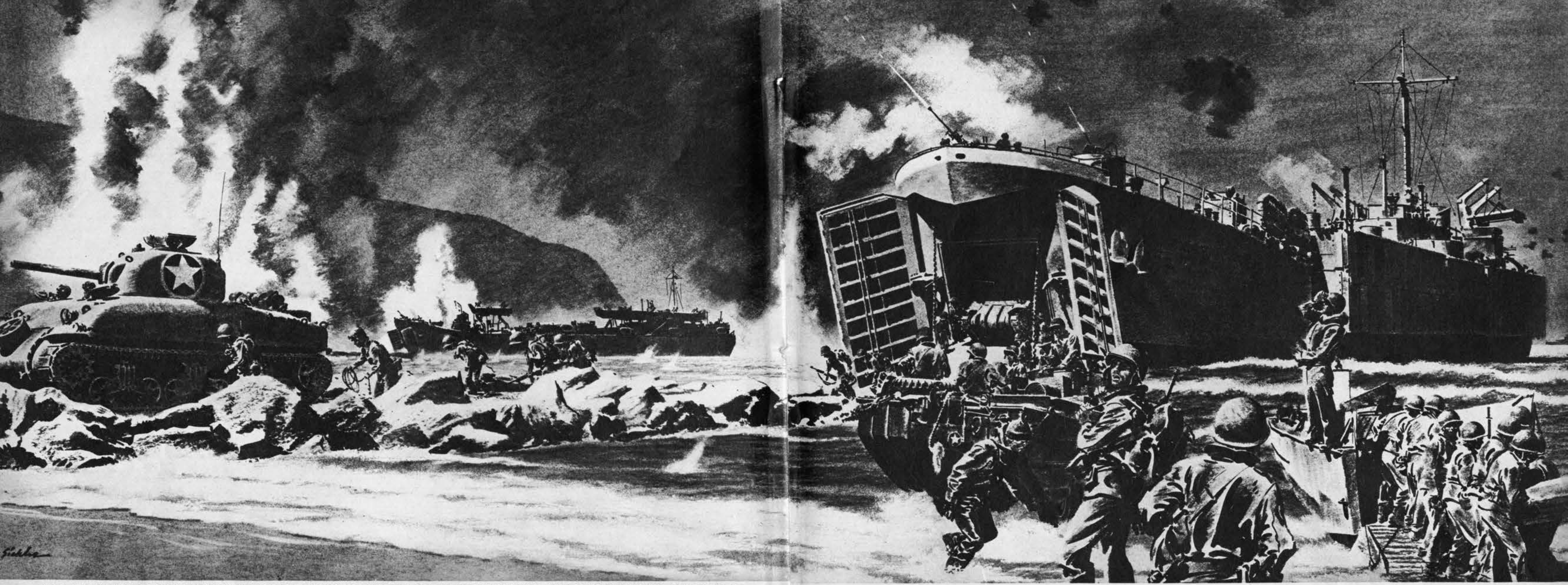


NOEL SICKLES' DRAWING OF INVASION SCENE SHOWS COMPLEXITY OF OPERATION, VARIETY OF EQUIPMENT USED. LST'S AT LEFT CARRY LCV'S. M-4 TANK IN LEFT FOREGROUND IS ABOUT TO BE JOINED BY SECOND M-4 EMERGING FROM LST WHICH HAS SECTIONAL FLOATS LASHED TO SIDE. IN RIGHT FOREGROUND ARE "DUCK" AND LCVP

# LANDING CRAFT

## NEW TYPES LEAD ASSAULTS ON BEACHES HELD BY ENEMY

Driven off the continent of Europe and pushed deep into the South Pacific, the Allies in 1942 had to revive an outmoded form of warfare—landing operations. Invasion by sea, even in earliest days of an expanding and warring world, was as commonplace as war itself. However, the developments which changed war from simple infantry and cavalry fighting to an involved mechanical holocaust stacked the cards very heavily in favor of the defense.

Three factors were responsible for the assumption that defensive power held the whip hand. The first was the increasing strength of coast artillery, considered more accurate at long range than naval gunfire. The second was the question of supply; since heavy guns and tanks could not be landed without dock facilities, infantry which might force a beach could be hacked to pieces by the defender's mechanized might. The third was land-based airpower.

Between World Wars I and II, military thinkers were convinced that because of the above factors, sea-borne attackers did not stand a chance against big-league opposition. But in World War II the Germans smashed Polish resistance on the Hela Peninsula from the sea, conquered Norway and Crete by sea and air. The Japanese made repeated landings in the course of their drive down the Malay Peninsula and took the Philippines, the Netherlands East Indies and a multitude of South Pacific islands by over-water invasion. It can be argued that most of these invasions did not come off according to the book. Coast defenses were feeble, land-based airpower was quickly crushed, treachery gave the invaders seaports intact (Bergen, Trondheim, Stavanger) enabling them, in some instances, to walk down gangplanks.

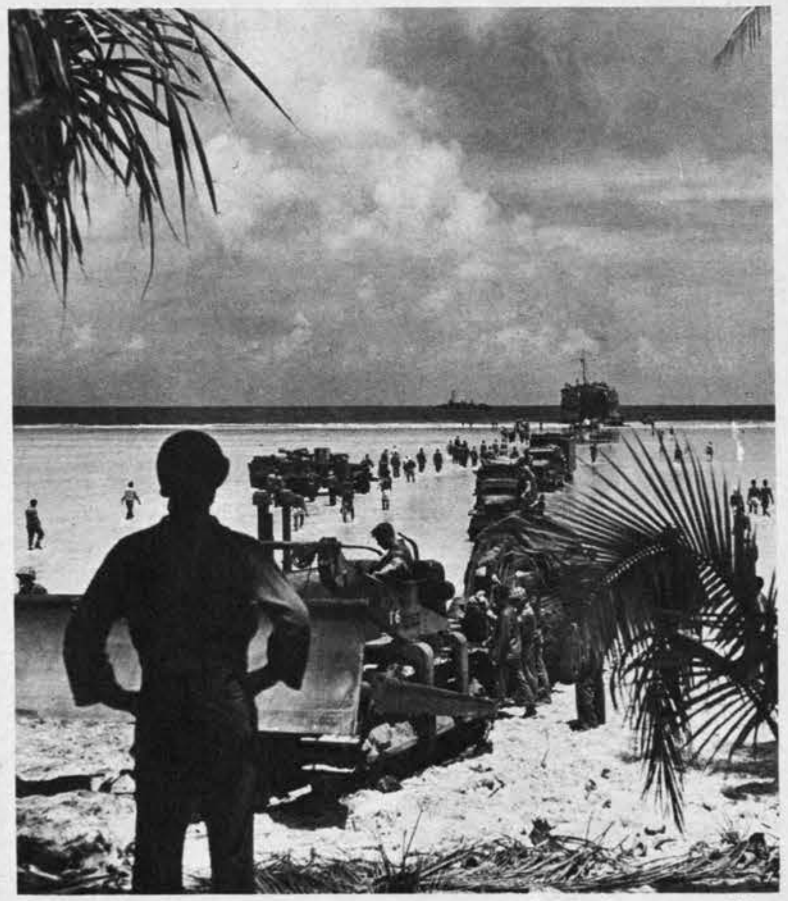
But regardless of whether Axis success in amphibious operations has proved or disproved anything, the Allied counteroffensive is based on storming the beaches. Abandoning the slow, vulnerable ship-to-shore methods of the past, the U. S. and Great Britain have developed nearly 15 types of landing craft: ships, barges, amphibious vehicles. They range in size from the ocean-going LST (Landing Ship, Tank) and LCI (Landing Craft, Infantry) to amphibian jeeps and rubber rafts. Where a short year ago patrol and escort craft had first priority in naval construction, landing vessels now have priority over all wartime construction.

Except for the recapture of Cos, Leros and Samos in the Aegean Sea, landing operations have, since the summer of 1942, become an Allied monopoly. But even before that, Combined Operations was executing swift stabs at German-held shore positions from the Lofoten Islands off the northern coast of Norway to St. Nazaire in western France. For the most part, these raids were not on a large scale, and the smaller landing craft sufficed to put the Commandos ashore.

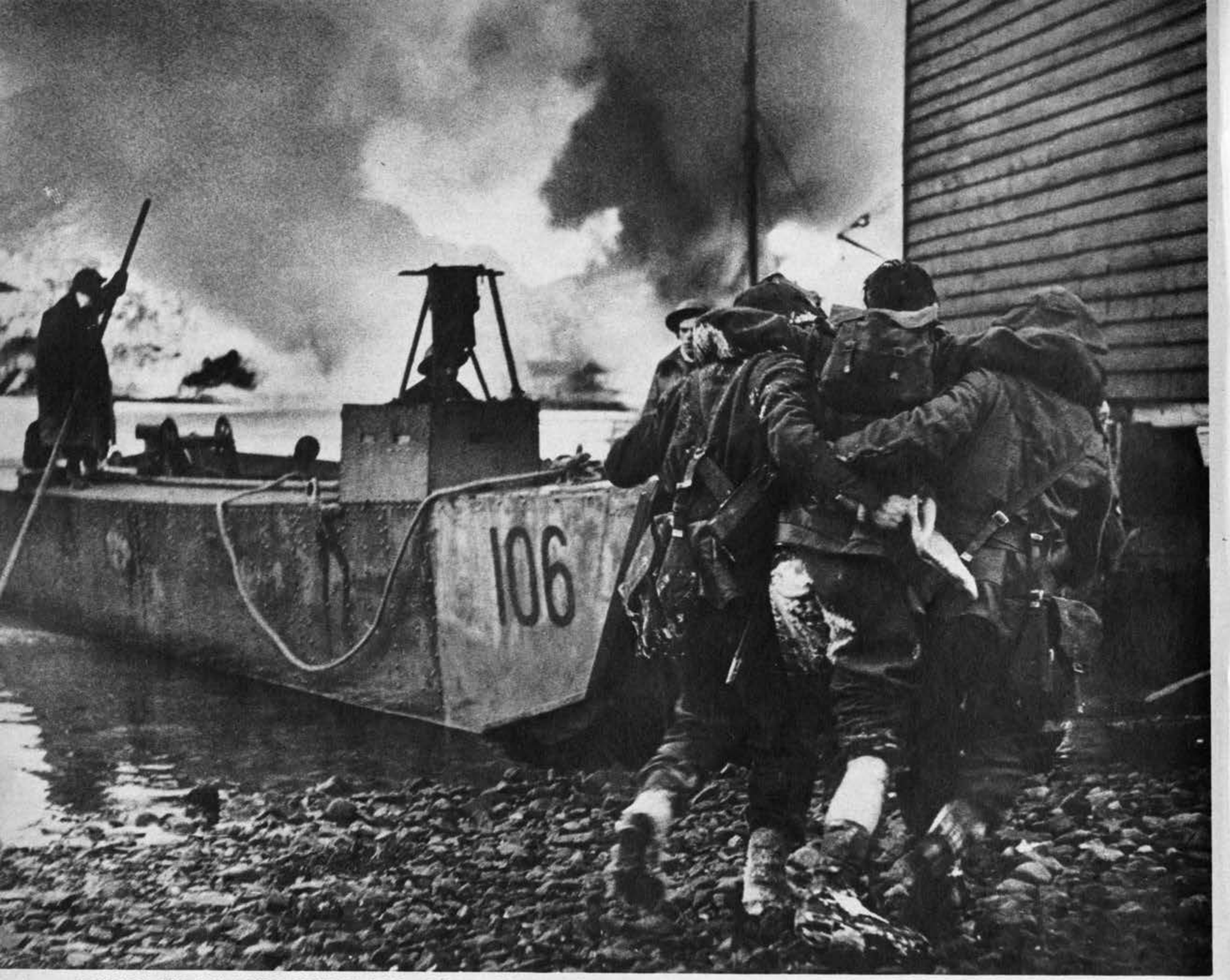
Climax to the Commando raids from the standpoint of size was the assault on Dieppe on Aug. 19, 1942. Involving 200 ships, 10,000 men and 40-ton Churchill tanks brought in by LCT's (Landing Craft, Tank), this landing was a severe enough laboratory test to satisfy the fussiest critic. The casualties were very heavy for the attackers, but the point that troops and tanks could be put ashore against the most rugged opposition was demonstrated.

Earlier in August U. S. Marines swarmed ashore on Guadalcanal to open the Allied attack in the Pacific. In this operation, as well as most of those in the South Pacific and the Aleutians, there was little or no Japanese resistance at the beaches, savage opposition farther inland. But at Tarawa late in November 1943, there was no chance of finding a weakly held strip of shore and the going was hellishly tough, geographically and militarily, from the start.

In November 1942, a huge United Nations convoy steamed into North African waters to seize control of Morocco and Algeria from the sea. Resistance was severe only in isolated spots, and in the military sense we got away with the easy type of invasion which marked German and Japanese conquests. However, in the summer of 1943 the Allies undertook two further invasions in the Mediterranean theater, Sicily and Italy. This time the beaches had to be stormed against experienced and well-armed defenders, had to be held while the heaviest equipment was being landed for big armies. It was here that the big landing boats, LST's and LCI's were introduced and proved their worth. How amphibious warfare in the West developed from Narvik to Salerno is shown on pages 36–39; pictures of the major types of U. S. landing craft on pages 40–47.



**PROCESSION OF TRUCKS** rolls ashore from LST as U.S. Marines occupy Nanumea in Ellice Islands near the Gilberts. A converted destroyer, possibly a high-speed transport (APD) or seaplane tender (AVD), is on patrol offshore.



COMRADES HELP COMMANDO WOUNDED IN VAAGSOE-MAALOY RAID TOWARD A BRITISH LCA (ASSAULT). THIS CRAFT OFFERS PROTECTION FROM MACHINE-GUN FIRE

# NORWAY AND THE CHANNEL

Three purposes have been served by the countless Commando attacks against German objectives on Norwegian and French shores. Specific targets may be destroyed; defenses are tested and experience gained in amphibious warfare. The best example of a target destroyed was the demolition of the radar station at Bruneval in France. Best example of the other two was Dieppe.

As early as June 1940, scarcely more than a month after the Wehrmacht attacked in the West, raiding parties stabbed at the Nazi-held coast to study defenses, take prisoners. First sea attack in which destruction was the main object took place on March 4, 1941, in the Lofoten Islands, far up the Norwegian Coast. Just before the end of 1941 a second major raid was undertaken in the North, this time against factories and shipping at Vaagsoe and Maaloy (*above*).

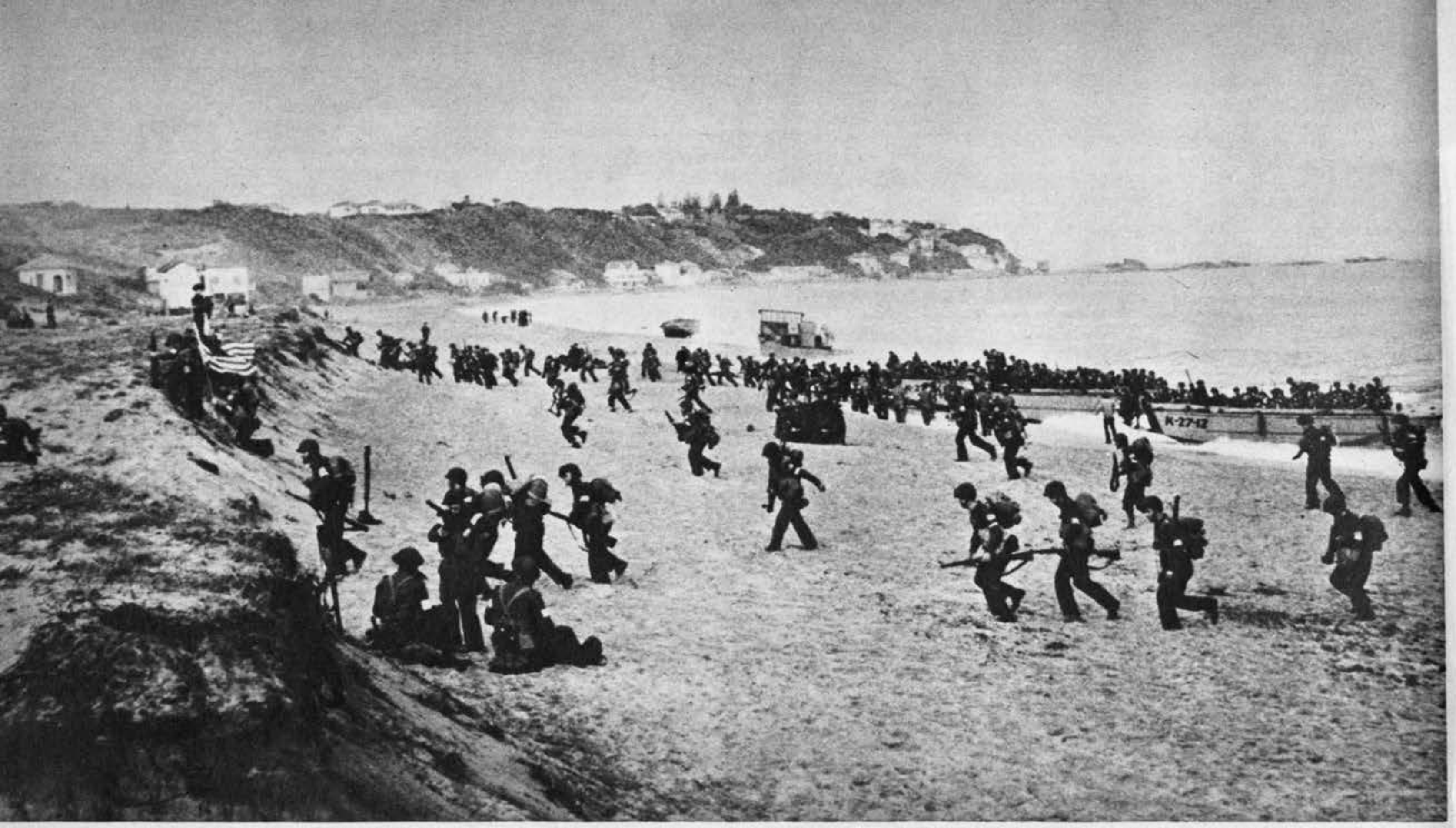
Shifting attention to France, Combined Operations then attacked Bruneval in February 1942. A month later, H. M. S. Campbeltown was rammed in and blown up at St. Nazaire to wreck the only Atlantic drydock capable of handling the battleship Tirpitz. Dieppe, in August 1942, was the biggest raid of all, served as an experiment in landing tanks, knocking out gun positions.

**DIEPPE CONVOY** demonstrated importance of patrol and escort craft in landing operations. Pictured here are minor combatant types of the Royal Navy.

BRITISH LANDING CRAFT HEAD FOR NARVIK UNDER COVER OF HEAVY FIRE FROM ALLIED WARSHIPS. BARGES WERE EARLY TYPE, BUILT FOR USE OFF ROCKY COASTS

**LANDING CRAFT (LCP'S)** race for Dieppe shore under cover of smokescreen laid down by the Royal Navy. Attack marked first use of British LCT's.

**COMMANDOS RE-EMBARK IN LCA'S** after a successful reconnaissance raid near Boulogne in June 1942. The boats on the beach are French fishing vessels.

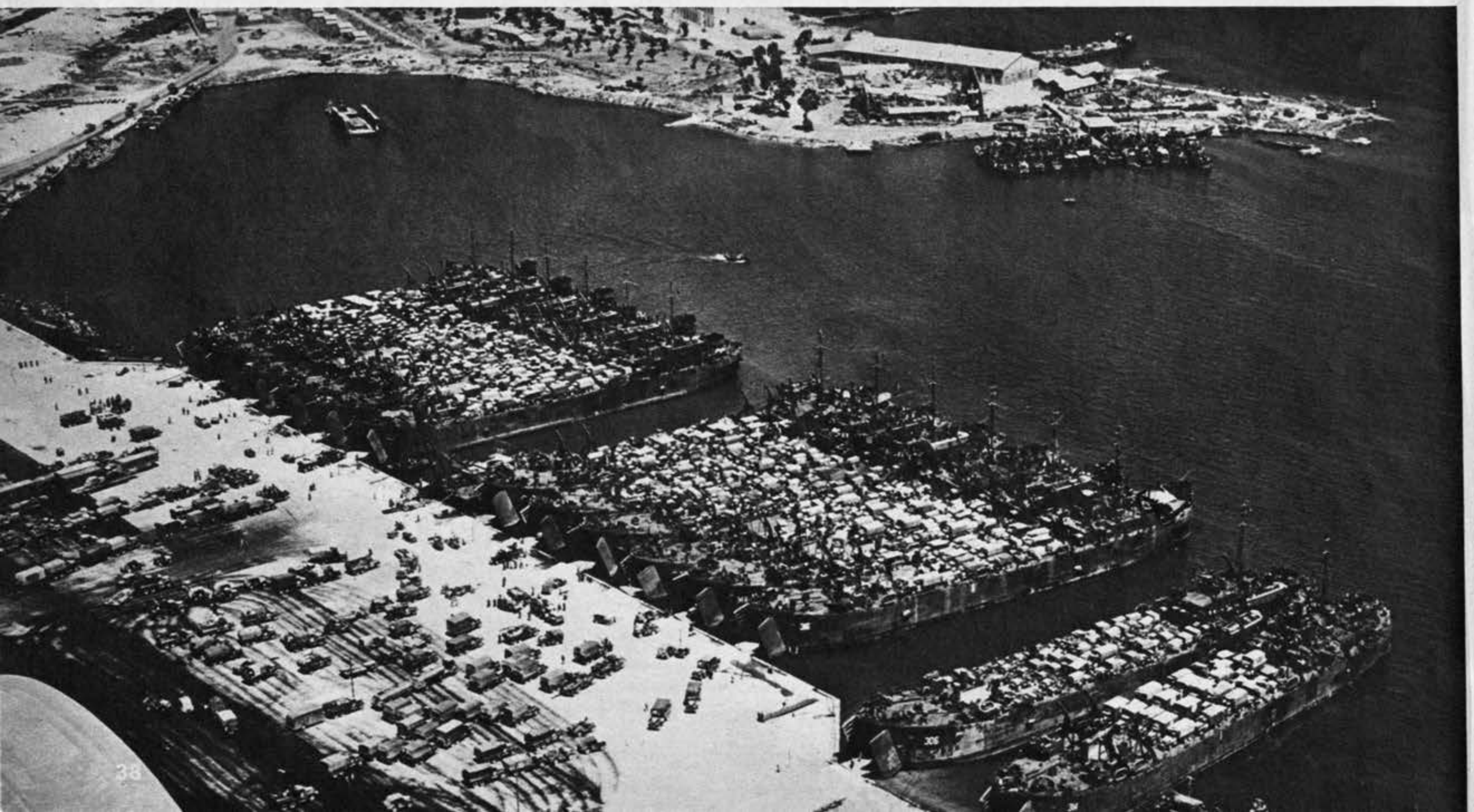


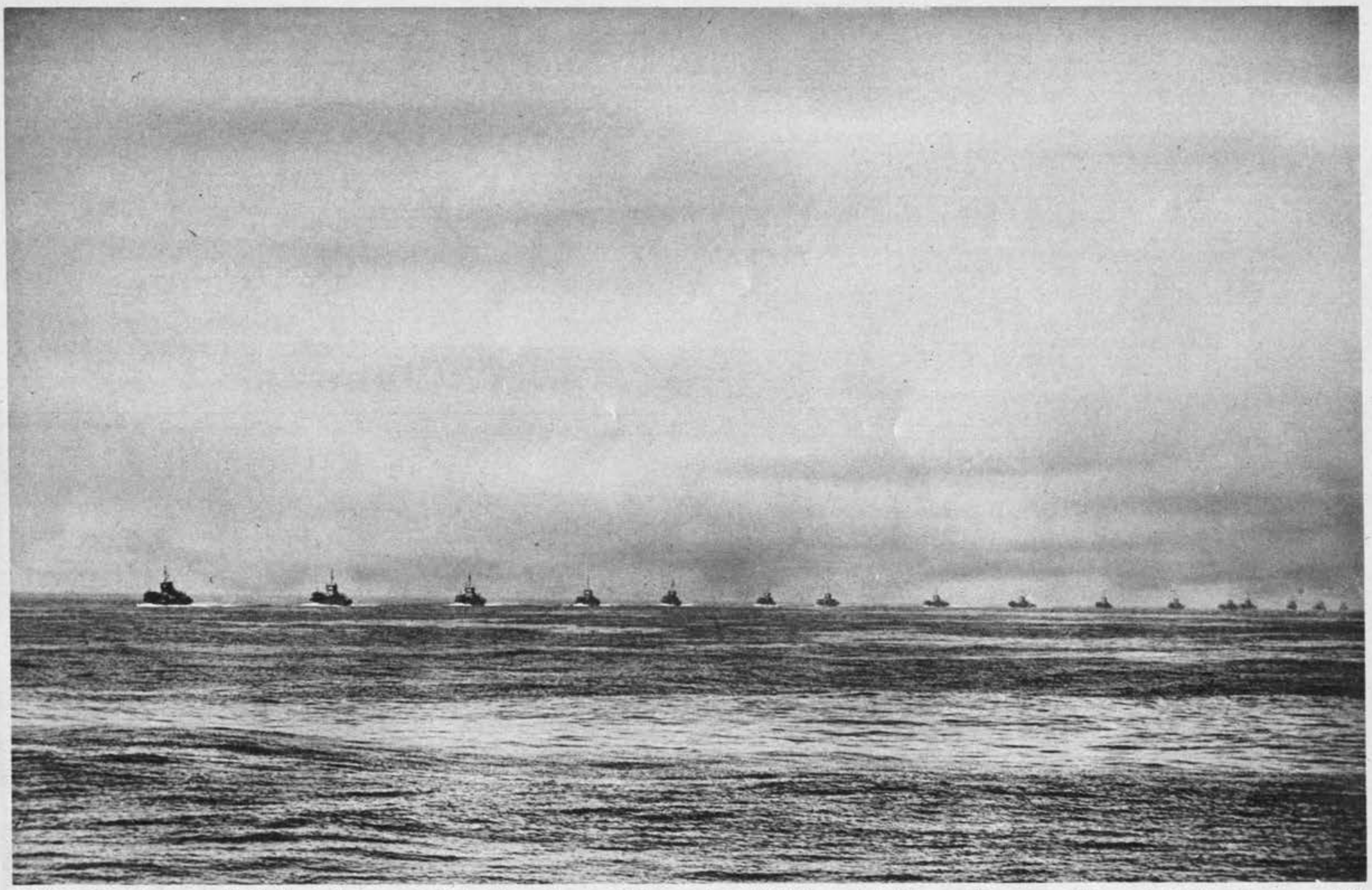
AMERICAN LANDING AT SURCOUF IN NORTH AFRICA SHOWS USE OF SMALL CRAFT, ABSENCE OF HEAVY EQUIPMENT. SCENE INDICATES LACK OF SERIOUS RESISTANCE

# THE MEDITERRANEAN

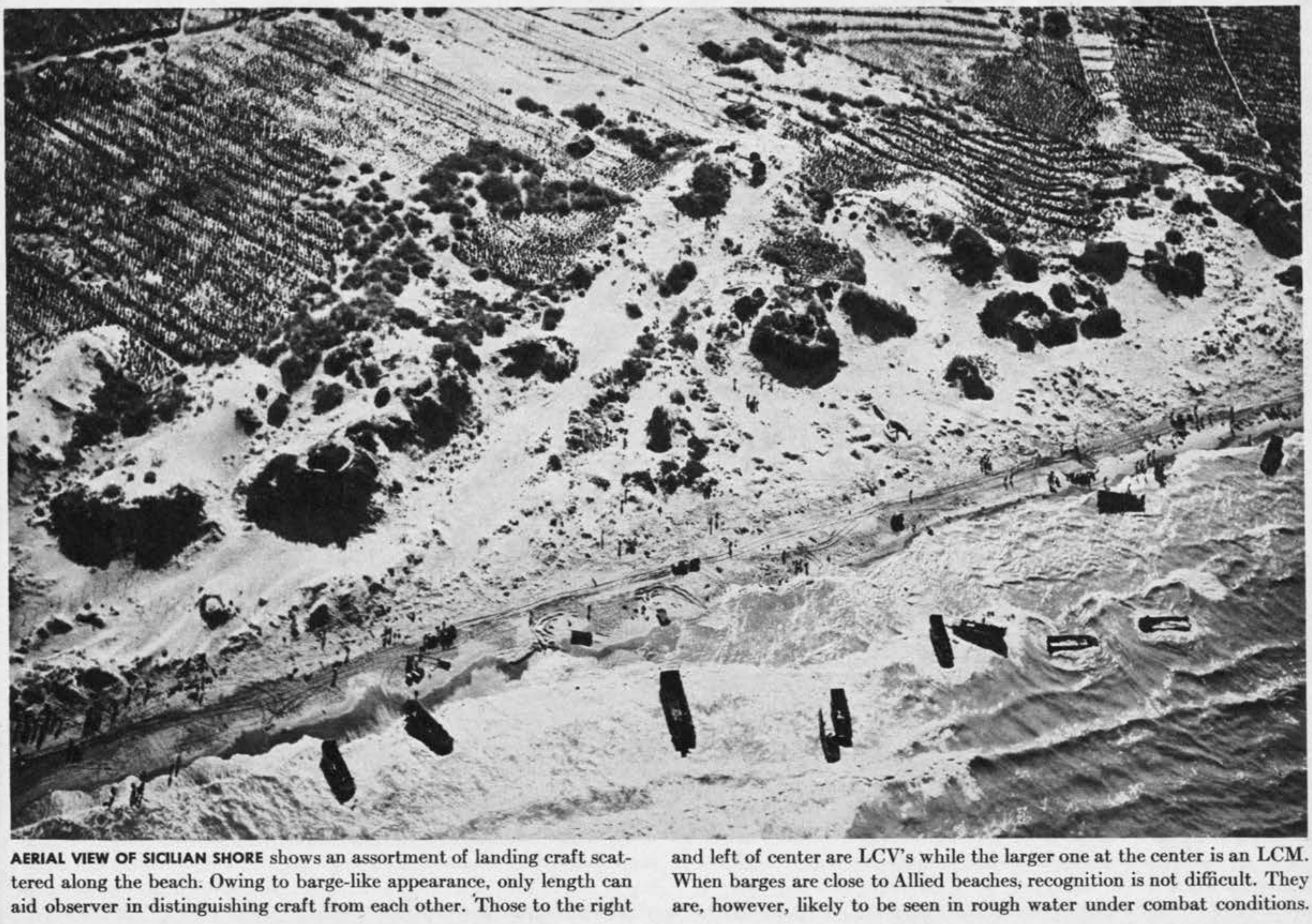
The three great amphibious operations in the Mediterranean were the assaults on French Africa, Sicily and finally the Italian mainland. Departures from earlier landings in that they opened full-scale campaigns, they introduced supply problems which did not have to be considered in the lightning-like Commando raids in the West. Algiers and Casablanca in Africa and Augusta in Sicily fell to the Allies very quickly, giving them good harbors for unloading. Salerno, however, was a different matter, since a great deal of heavy fighting took place before that city or the port at Naples were of any value to the invading forces. Here conditions were tough enough to satisfy military experts that a fair test of invasion strength was being made. The enemy was firmly entrenched and ready for the landing where it took place; they had airfields nearby from which they could hammer at the convoy. But carrier-based Seafires held them off while coordinated amphibian assault waves bulled their way through to take and hold the beach.

SUPPLY TRUCKS SHUTTLE TO & FRO LOADING HUGE ARMADA OF LST'S AT A NORTH AFRICAN PORT. SHIPS WERE PART OF CONVOY WHICH OPENED SALERNO ATTACK



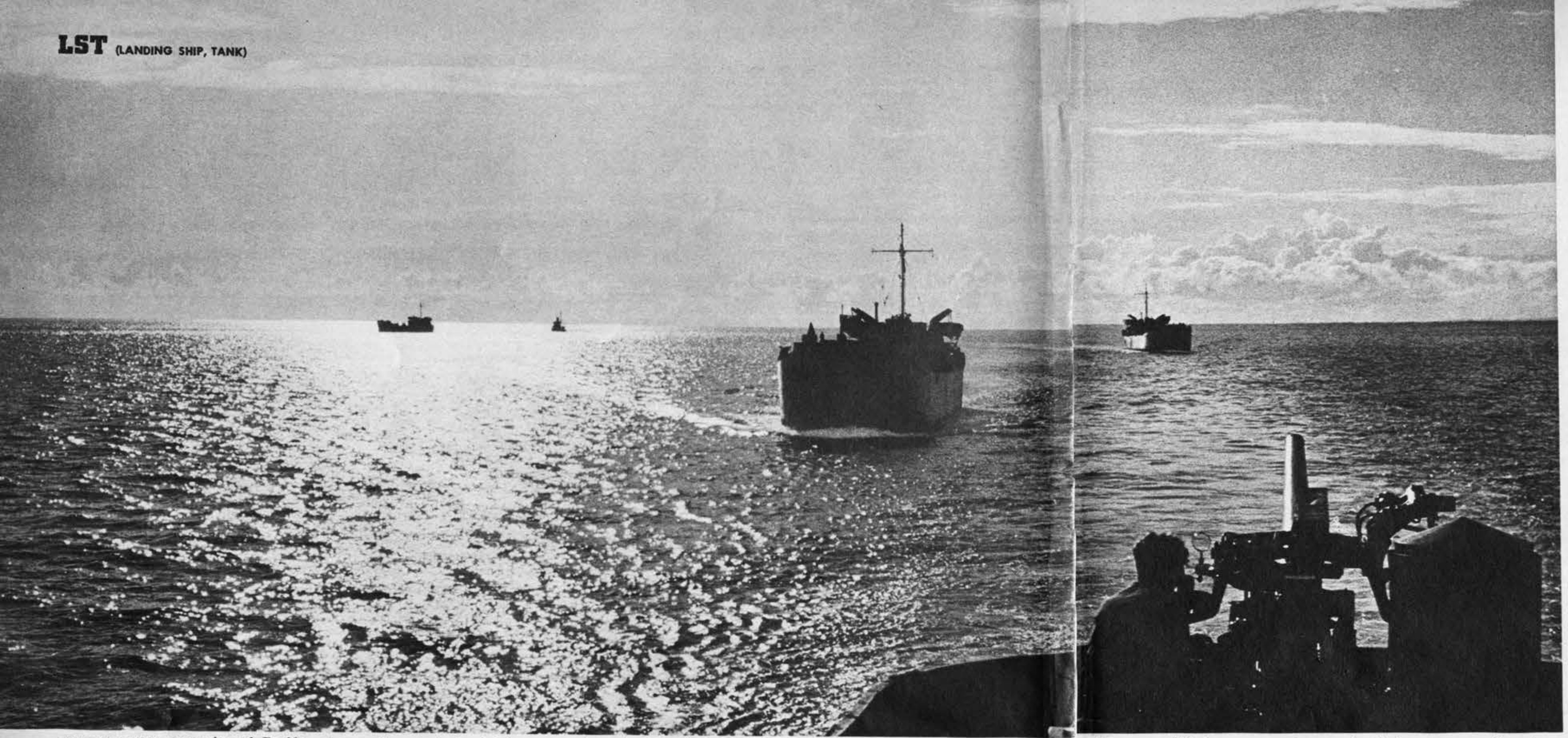


**SICILY-BOUND LCI'S** carry U. S. Seventh Army to Gela where the most bitter beachhead opposition of the entire campaign was encountered. Fire from DD's finally turned the tide against Nazi tanks which threatened to drive U. S. forces into the sea. Heavy weather made the landing more difficult than was anticipated but added to the surprise element since the Italian defenders thought the sea so rough that invasion would be postponed.

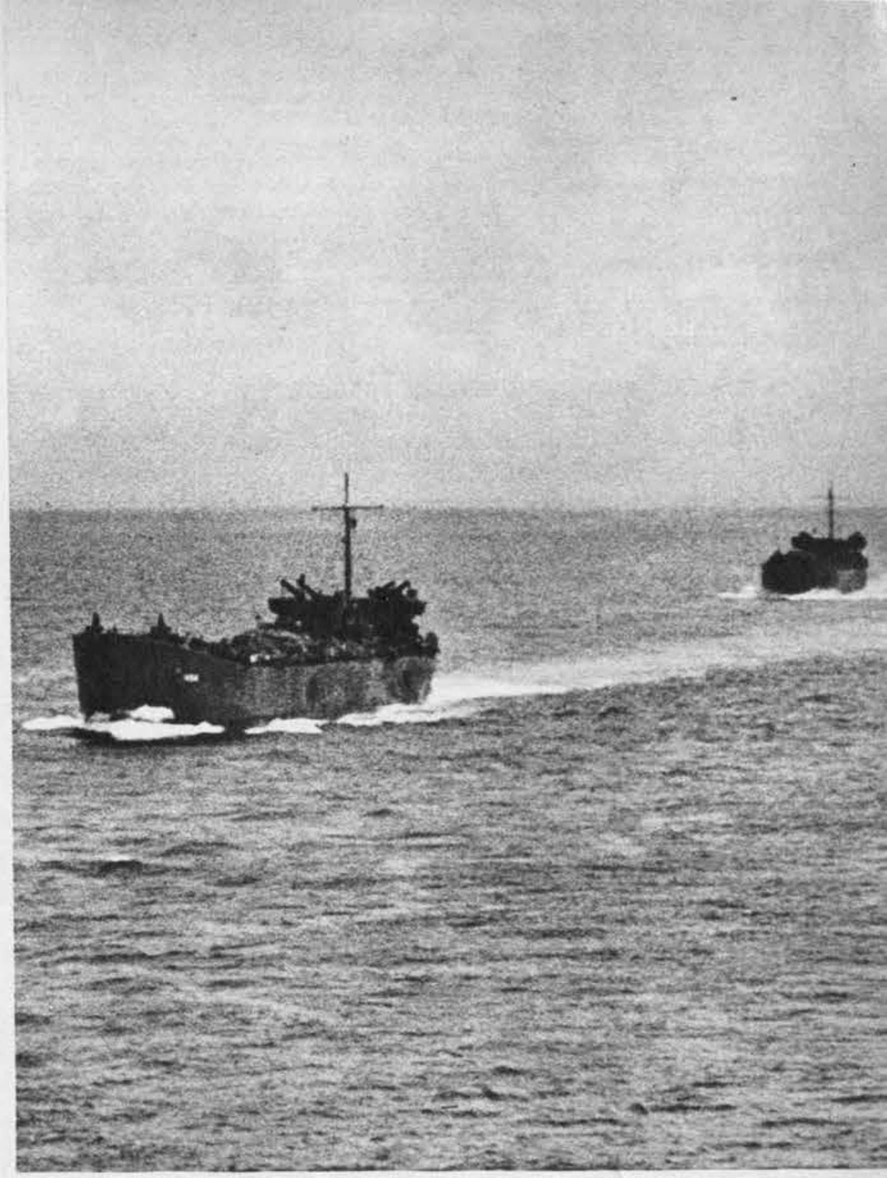


**AERIAL VIEW OF SICILIAN SHORE** shows an assortment of landing craft scattered along the beach. Owing to barge-like appearance, only length can aid observer in distinguishing craft from each other. Those to the right and left of center are LCV's while the larger one at the center is an LCM. When barges are close to Allied beaches, recognition is not difficult. They are, however, likely to be seen in rough water under combat conditions.

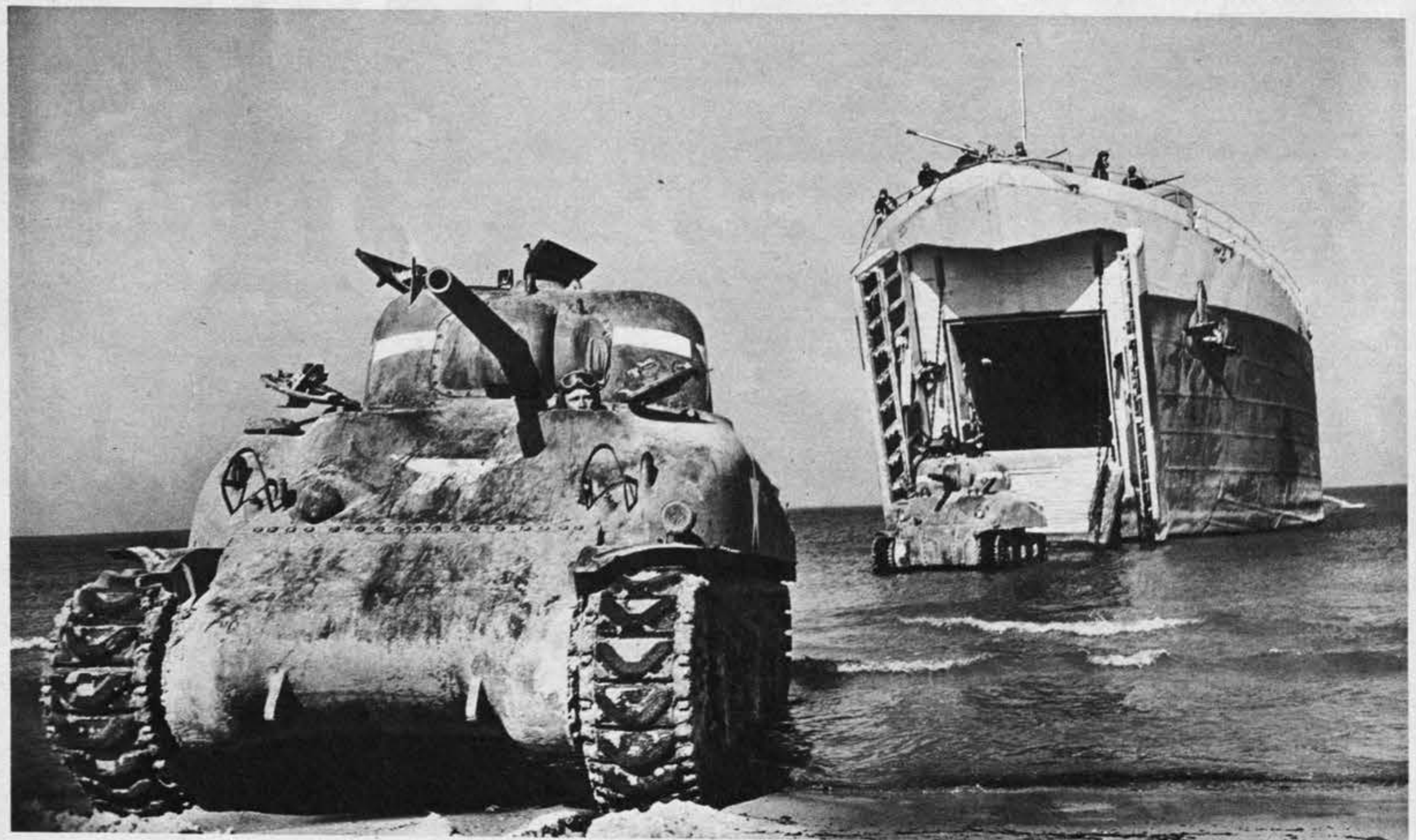
# LST (LANDING SHIP, TANK)



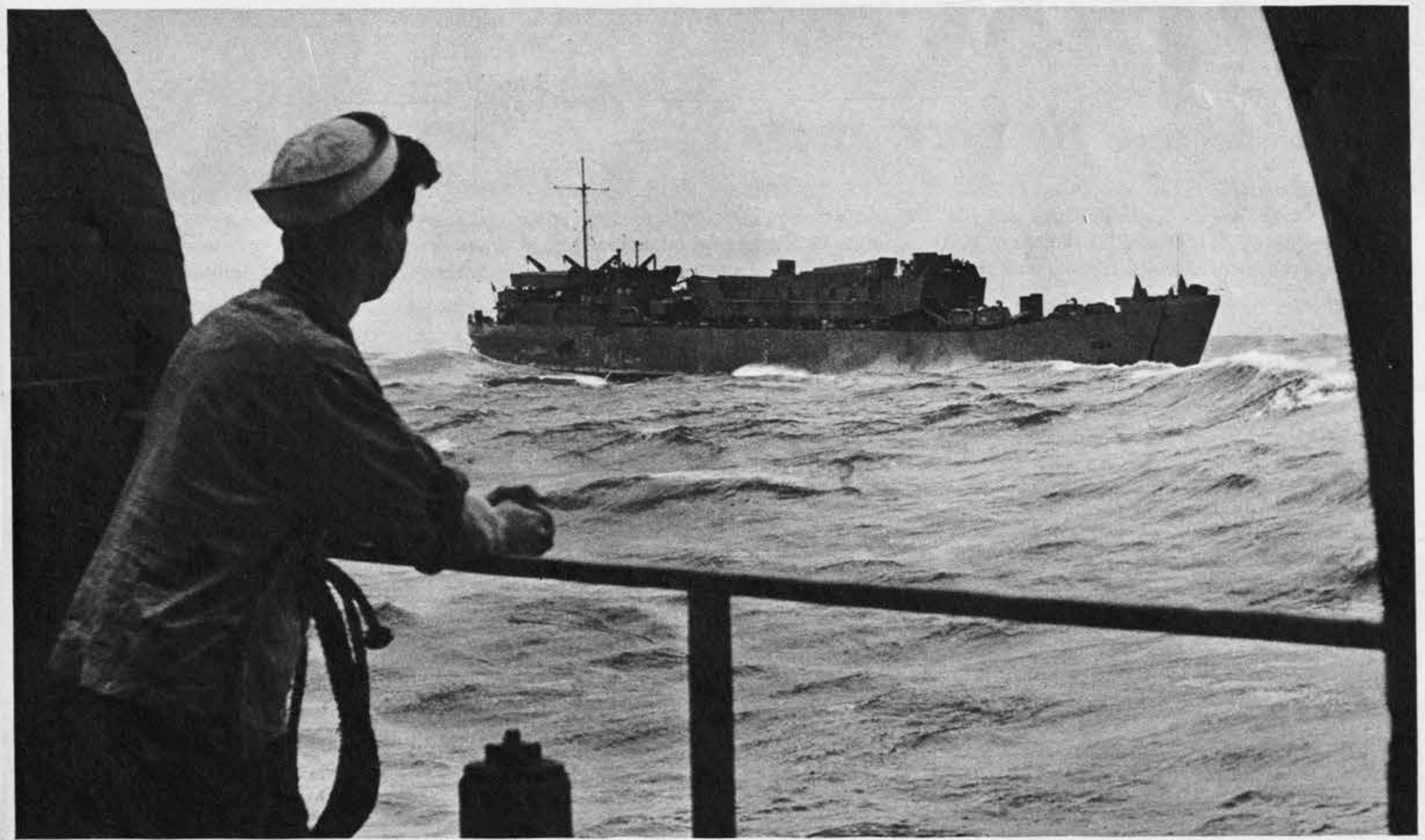
**GROUP OF LST'S** steam through Pacific waters on the way to Lae in New Guinea. The backbone of modern invasion armadas, these 5,500-ton ships carry all sorts of war matériel, are the most versatile of all landing craft, serving as both hospital and repair ships on occasion. They were originally sketched in November 1941, with acceptance trial for first completed unit coming 11 months later. Sicily marked their first combat use in the Mediterranean. Able to cross any ocean under their own power, these long-range ships are used to carry other landing craft to the scene of operations, frequently carry trucks and bulldozers as well on their wide decks.



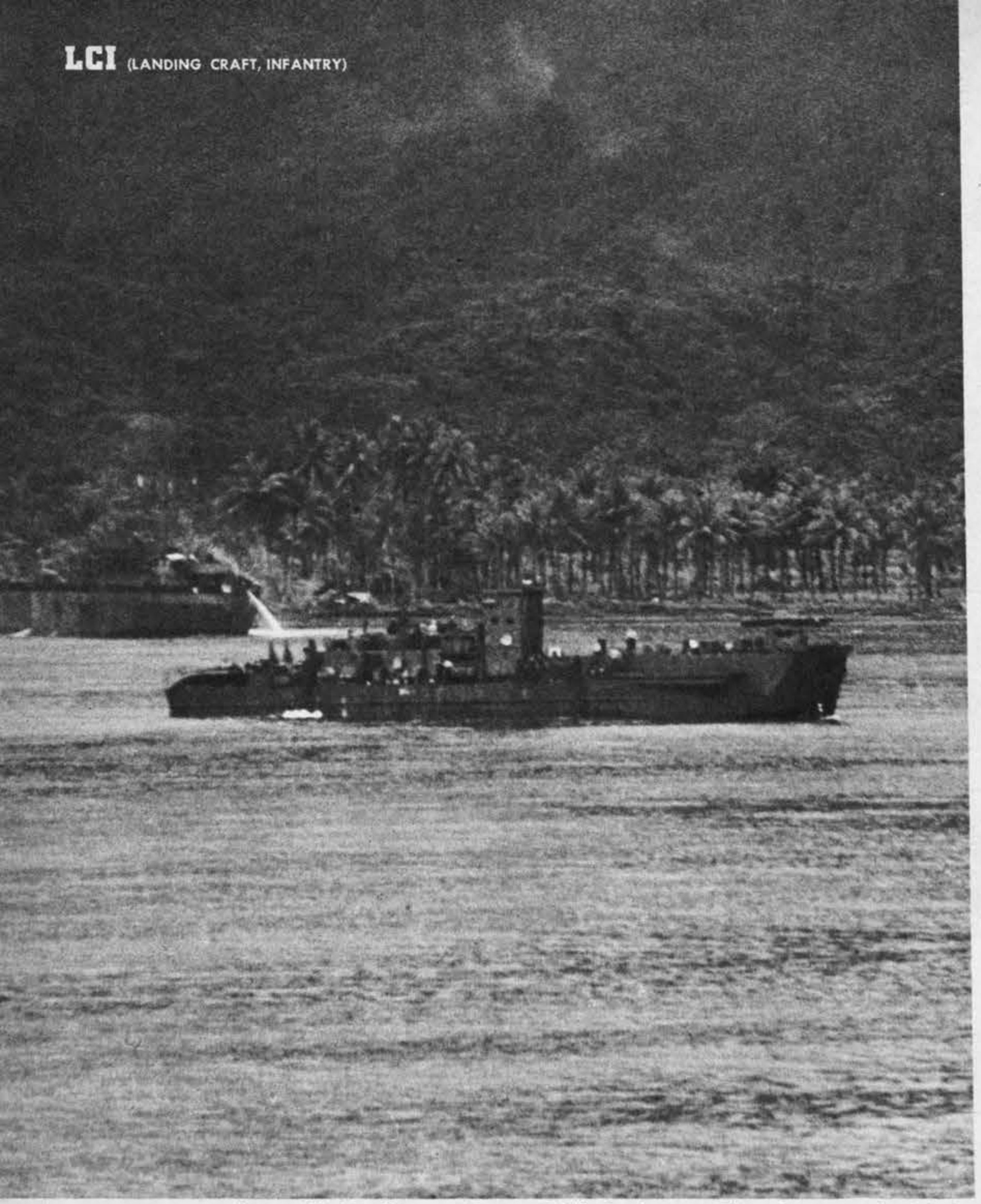
**ENGINES AFT, HIGH FREEBOARD FORWARD** and flush deck help identify LST's. Hull is straight-sided, tapers abruptly at bow and stern. Ship has short pole mast, no visible stack. Engines aft permit cargo space forward for landing.



**SIZE OF LST** can be judged from M-4 tanks rolling up on beach. Length of these ships is 327 ft. For unloading, gates are swung outward, ramp is then lowered for tanks or other mechanized equipment. Elevator service from deck to hold enables trucks to be lowered for disembarkation. Extra ramps can be carried on sides of LST in case bow of vessel cannot come in close enough to permit the vehicles to go ashore through shallow water.

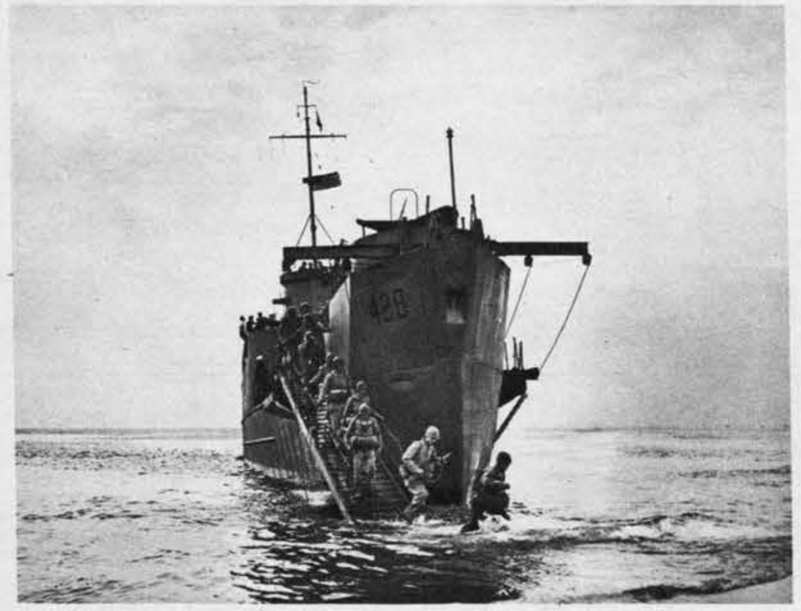


**DECKLOADS MAKE RECOGNITION** of LST's a major problem since cargoes carried topside vary considerably. This LST has LCT and LCM. Vents on deck forward of load are helpful for identification, particularly from the air. Except for the 450-ft. LSD's (Landing Ship, Dock), LST is the biggest of all the invasion craft. LST's versatility makes it possible for the Navy to free more specialized ships for service in other vital operations.

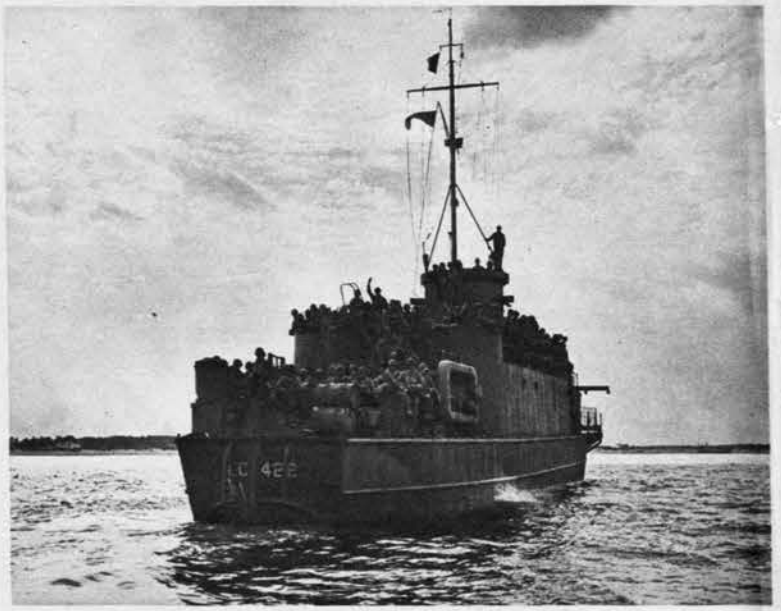


**LCI SAILS UP COAST** during Allied landings near Lae. Ship in background is LST. British request in May 1942 for larger type of infantry landing craft led to LCI's development. First unit was completed in October. LCI's can cross ocean under their own power, but only carry troops just before landing operations.

**LCVP'S COME ASHORE** ahead of LCI at Gela in Sicily. Ammunition ship in the background explodes following hit by Nazi bomber. Unlike many other invasion boats, LCI looks like a ship, not a barge. Just over 155 ft. long, it has bridge amidships, no visible stack. Block tower characterizes earlier version (*left*), while newer model has round tower. Put into mass production only recently, the round-tower model is being supplied to Great Britain via lend-lease on a large scale. Appearance of LCI, as well as wake, has led to its being confused with subs.

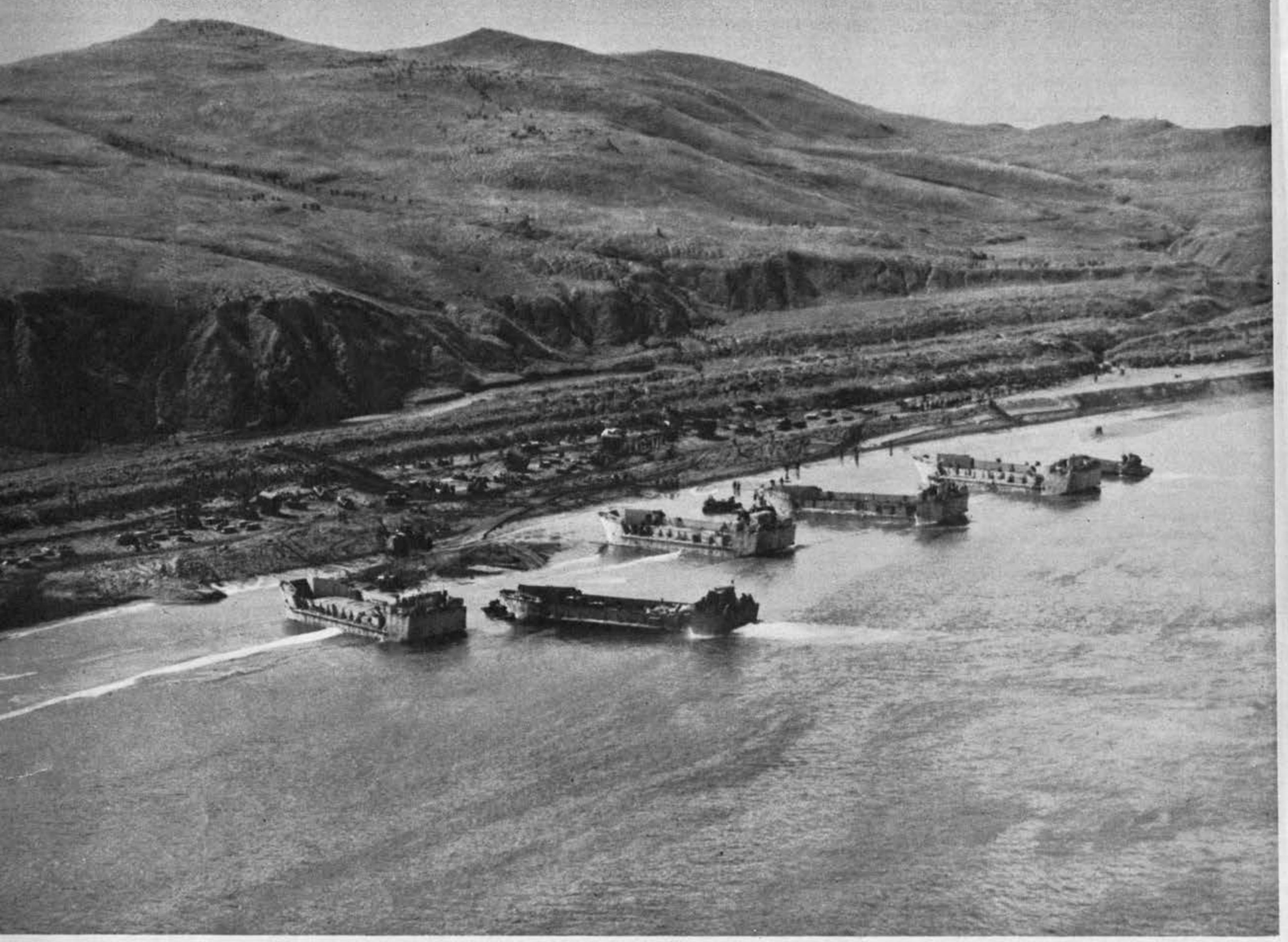


**SOLDIERS RUSH DOWN RAMP** of LCI a few yards offshore. Ramps are carried outside forward bulwarks, provide excellent recognition feature for low-flying planes. LCI may carry more than 150 men, accommodates them in the hull.

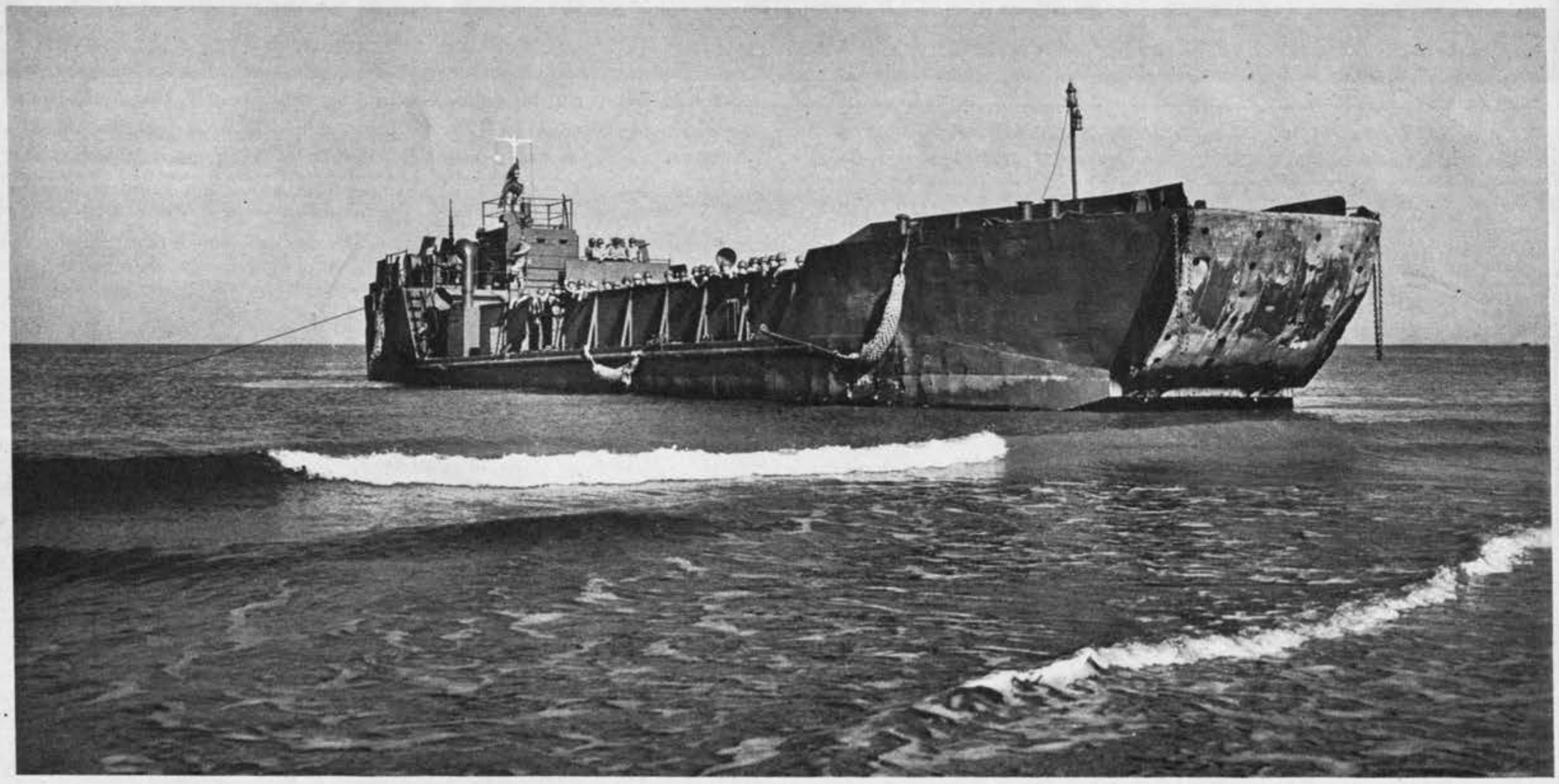


**STICK MAST ABAFT BRIDGE,** flush deck help identify LCI. The unit shown here is newer class, differs from old type (*above, left*) in superstructure and AAMG position. Depth charges at stern provide anti-sub defense.

**LCI'S HEAD FOR SHORE** in Salerno attack. Their low hulls may cause confusion with DD's or minor combatant types when seen from this angle, but LCI's should be distinguishable by relatively bulky outline. Developed simultaneously with LST's, LCI's are the only other beaching types likely to be encountered on the high seas. They are not usually seen at the beaches during preliminary stages of assault when smaller craft are used.

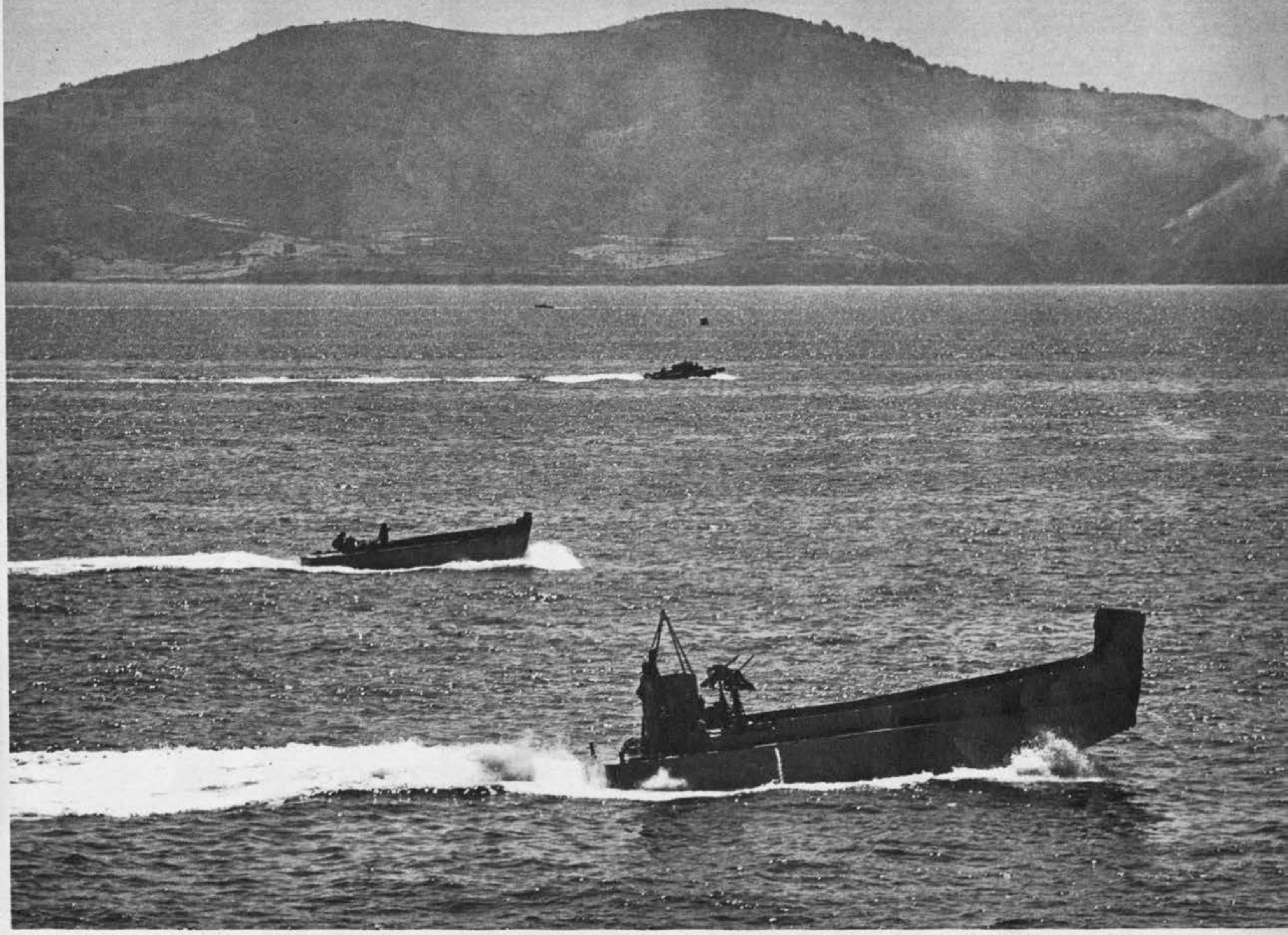


**LCT'S, SHOWN HERE AT KISKA,** are largest of the landing craft to have ramp for bow. Logical development of an early type LCM, they were first built in May 1942, were designed to bring in tanks behind first wave of assault troops. LCT's are frequently carried in three sections on cargo ships, transports or as assembled units on LST's. With sides cut away, LCT's can be lined across bow of LST when conditions prevent use of portable ramps.

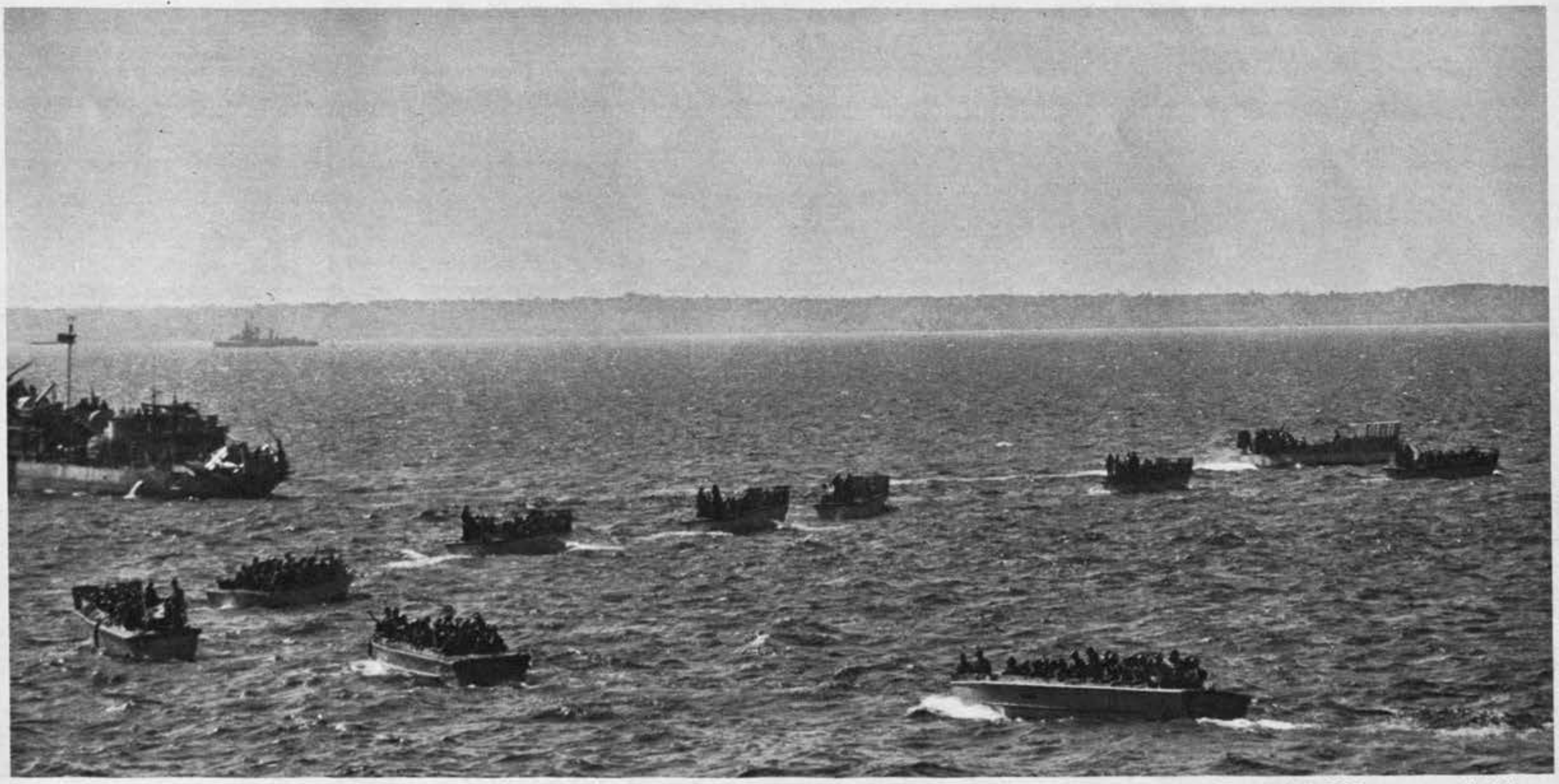


**BEACHED LCT** gives indication of craft's length, 112 ft. for Mark V (*above*) and 105 ft. for Mark VI which differs slightly, having longer, higher off-center superstructure at stern, shorter center section. Squared-off bow, pilot house aft are important recognition details. As with LST, recognition of LCT is made more difficult owing to differing loads: tanks, trucks, personnel. Shape and wake classify LCT's and most smaller craft as barges.

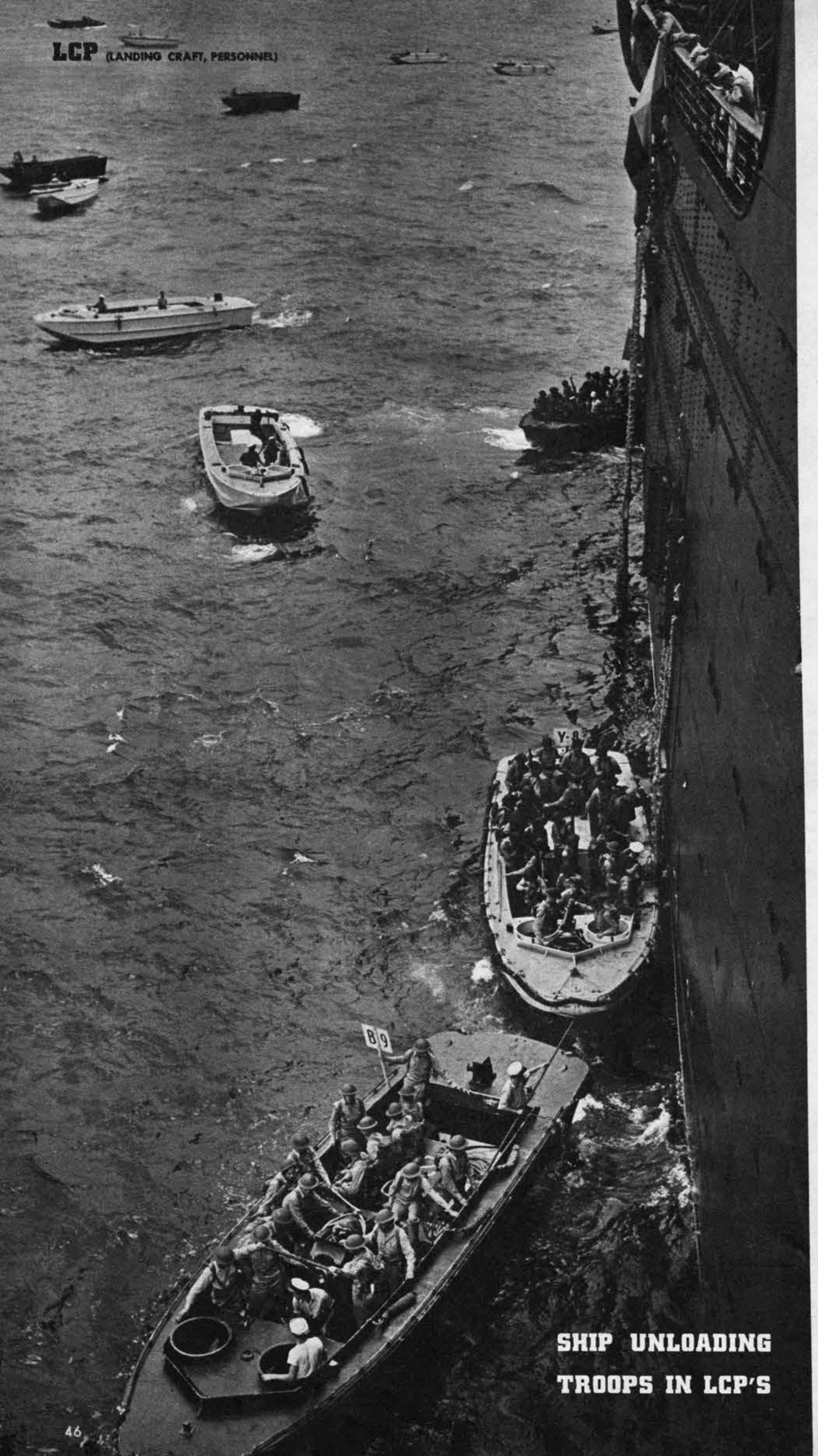
## **LCM** (LANDING CRAFT, MECHANIZED EQUIPMENT)



**LCM AND LCVP** race for shore near Salerno. LCM with anti-aircraft machine guns is in right foreground, can be identified by high grilled bow ramp. This type is 50 ft. long. LCV's (Landing Craft, Vehicles) double up as vehicle and personnel carriers, are called LCVP when used in the latter capacity. About 36 ft. in length, they have also been built with a small pilot house at the stern. The ramp and the sides of the LCV are armored.

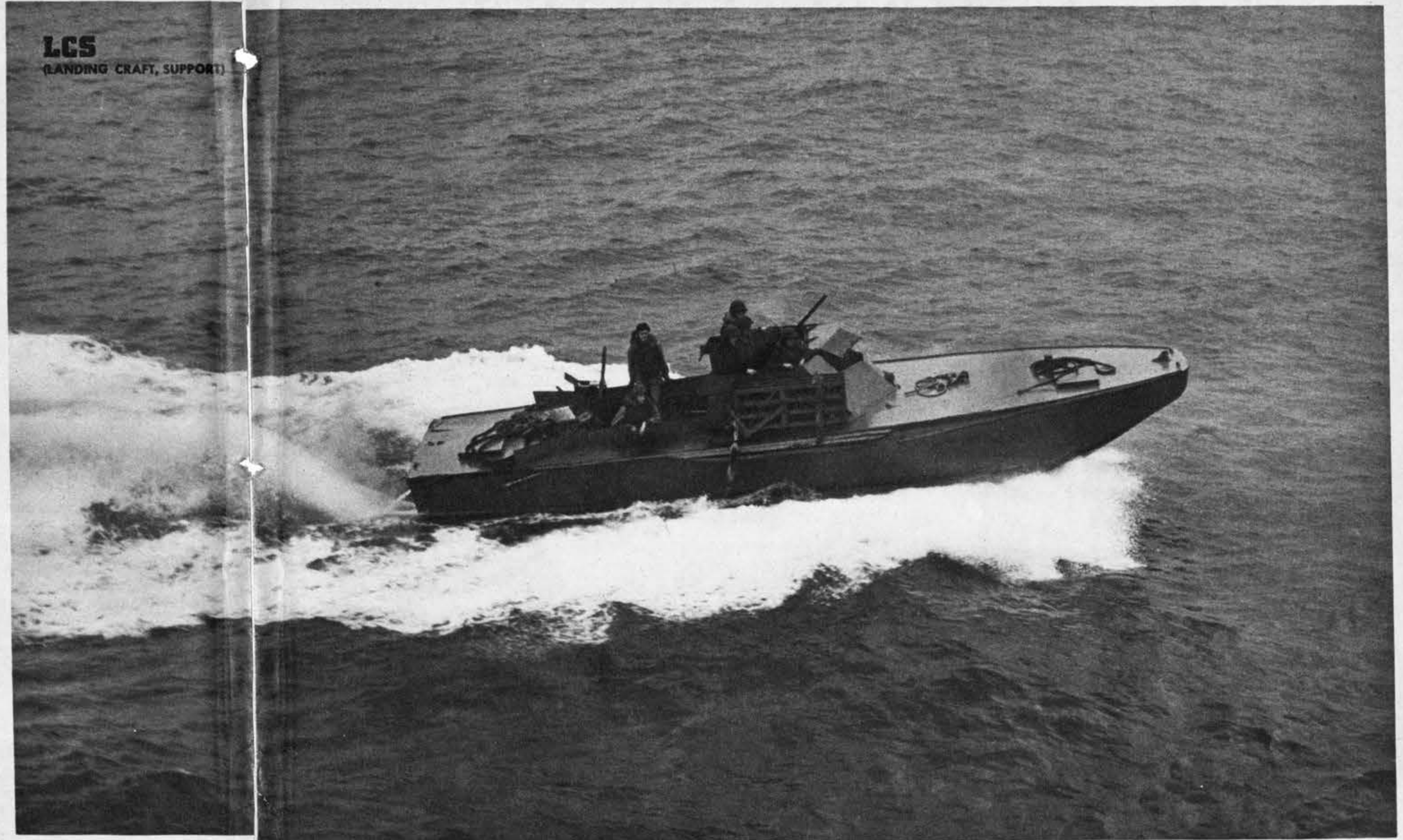


**VARIED LANDING CRAFT MANEUVER** in Chesapeake Bay just before departure for North Africa. Grilled bow of LCM is distinguishable at the right. Craft in the foreground are 36-ft. LCP's (Landing Craft, Personnel) and LCPR's (Landing Craft, Personnel, with Ramp). LCP has a rounded bow, looks less like barge than other invasion boats (*see next page*). Towing rubber landing rafts (LCR's) is important function of LCP's and LCPR's.



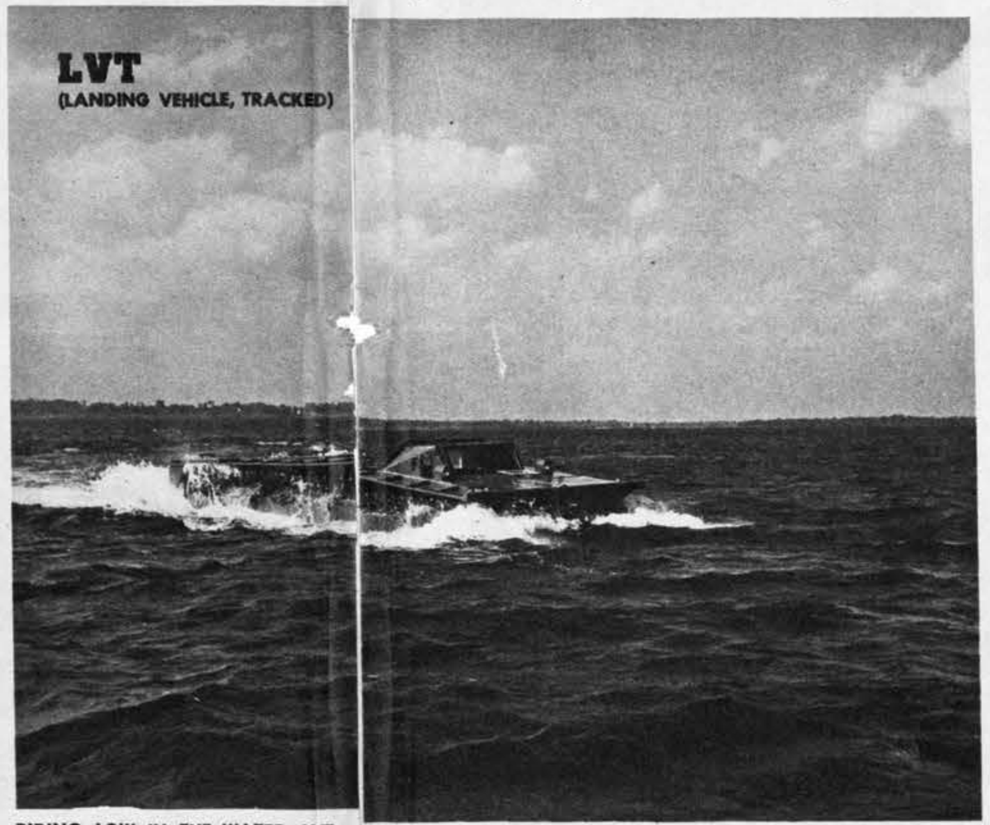
**LCP** (LANDING CRAFT, PERSONNEL)

**SHIP UNLOADING TROOPS IN LCP'S**



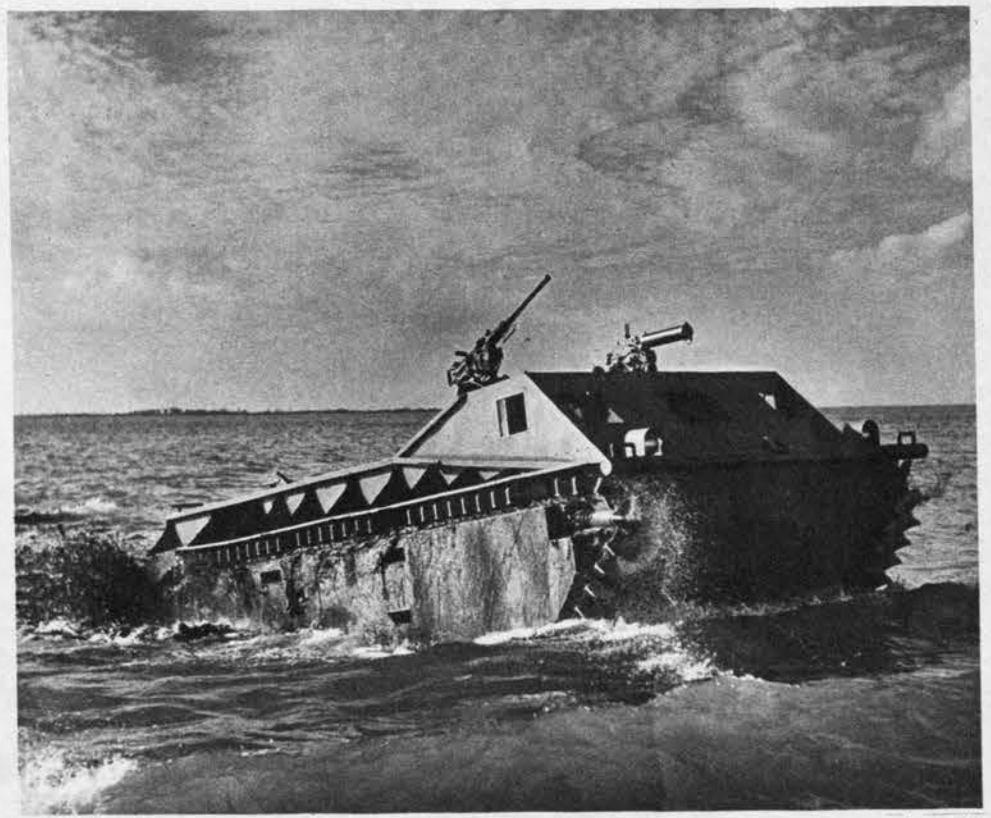
**LCS** (LANDING CRAFT, SUPPORT)

**CLOSE-UP FIRE SUPPORT** for landings is given by heavily armed LCS (Landing Craft, Support). This armored, rocket-firing boat is likely to be seen in the first wave, rendering the beaches untenable for the enemy before LCP's go ashore with the infantry. Unlike other landing craft, LCS's do not transport personnel or equipment, carry crew just large enough to man the boat controls and weapons. Armor plate can be put up to shield the crew completely from enemy small-arms fire, gives LCS the appearance of low blockhouse on a speedboat.



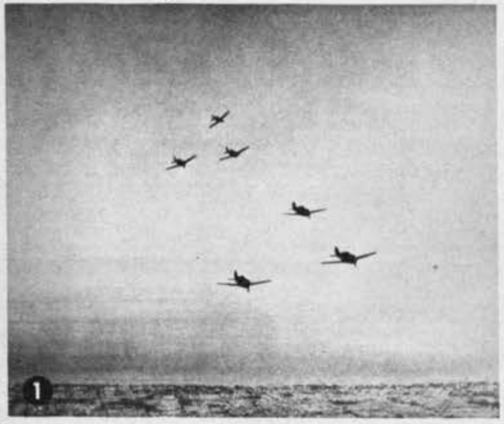
**LVT** (LANDING VEHICLE, TRACKED)

**RIDING LOW IN THE WATER, LVT** (Landing Vehicle, Tracked) offers a poor target to shoregunners. First developed for rescue work in swamps following Florida hurricane of 1933, the versatile LVT attracted the attention of U. S. Marine Corps and was adopted by them.



**LVT ROLLING UP BEACH,** shows self to be genuinely amphibious vehicle. Ability to negotiate all sorts of terrain, including coral reefs which would rip tires on "duck" or amphibian "jeep," is the greatest asset of LVT or Alligator. Armored version, LVT(A), has turret with 37-mm. gun.

# QUIZ NO. 4: WARPLANES IN E.T.O.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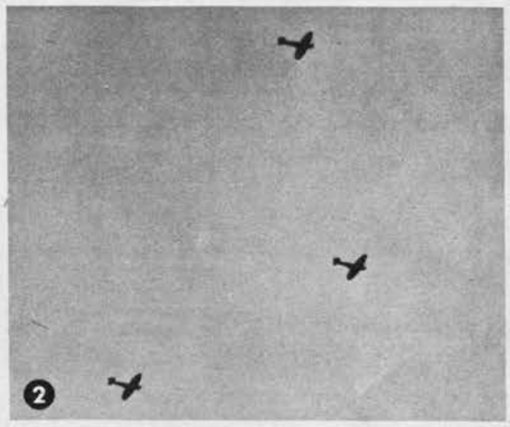
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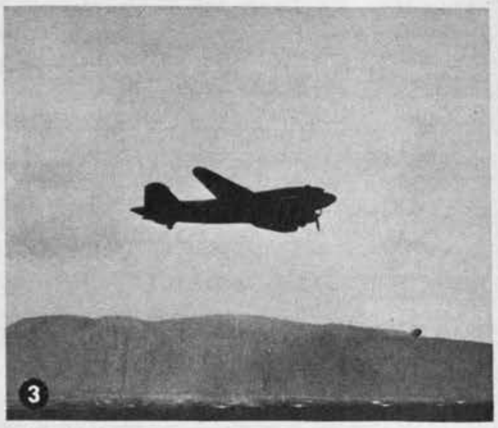
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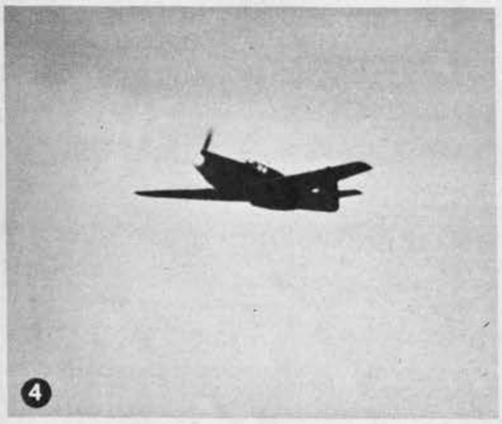
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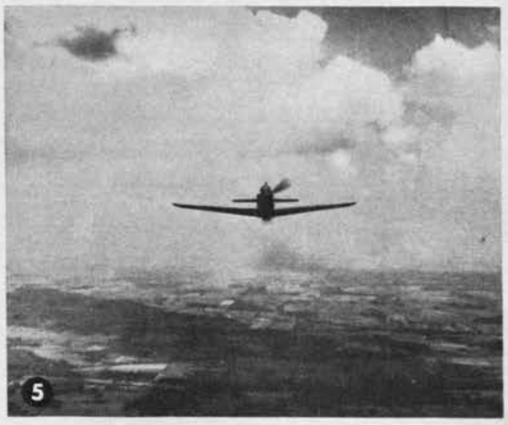
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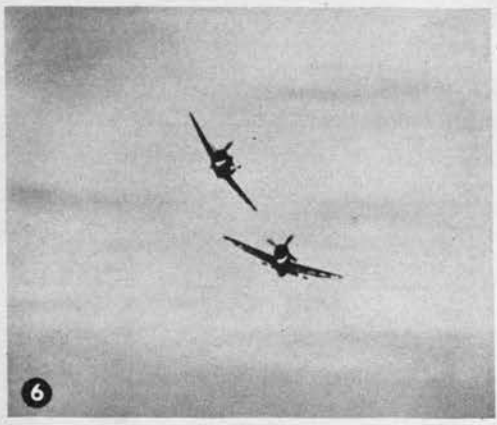
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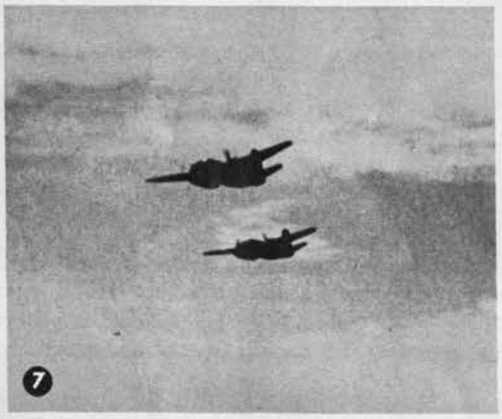
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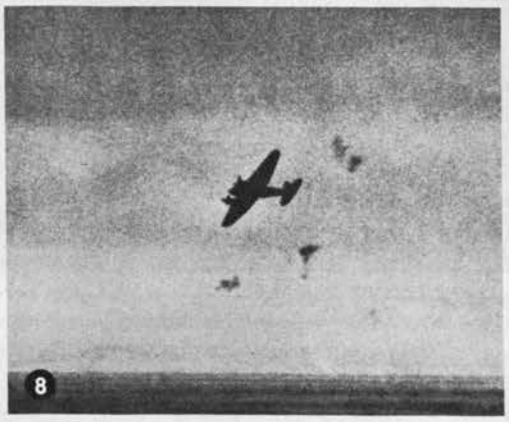
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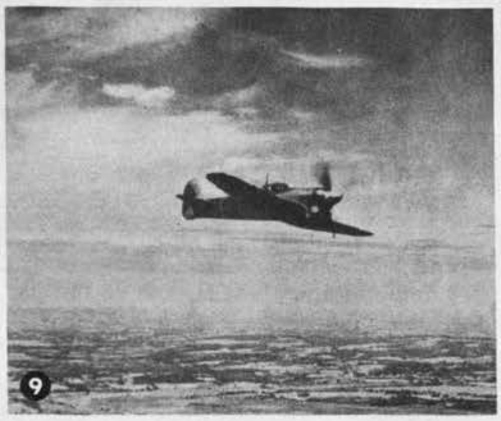
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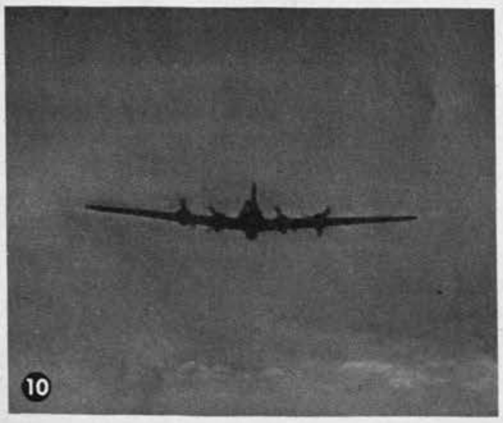
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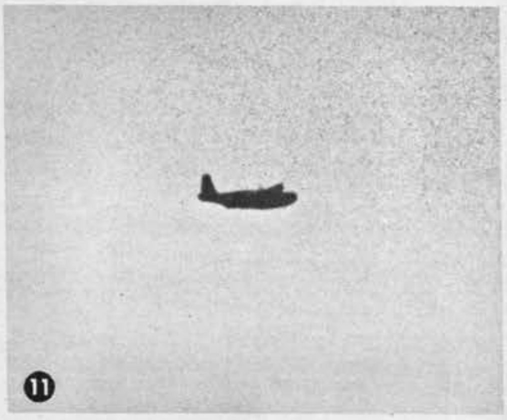
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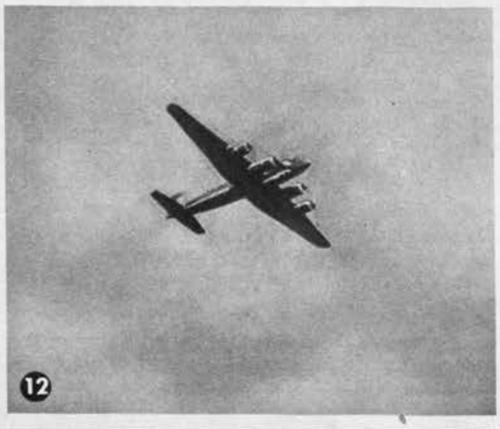
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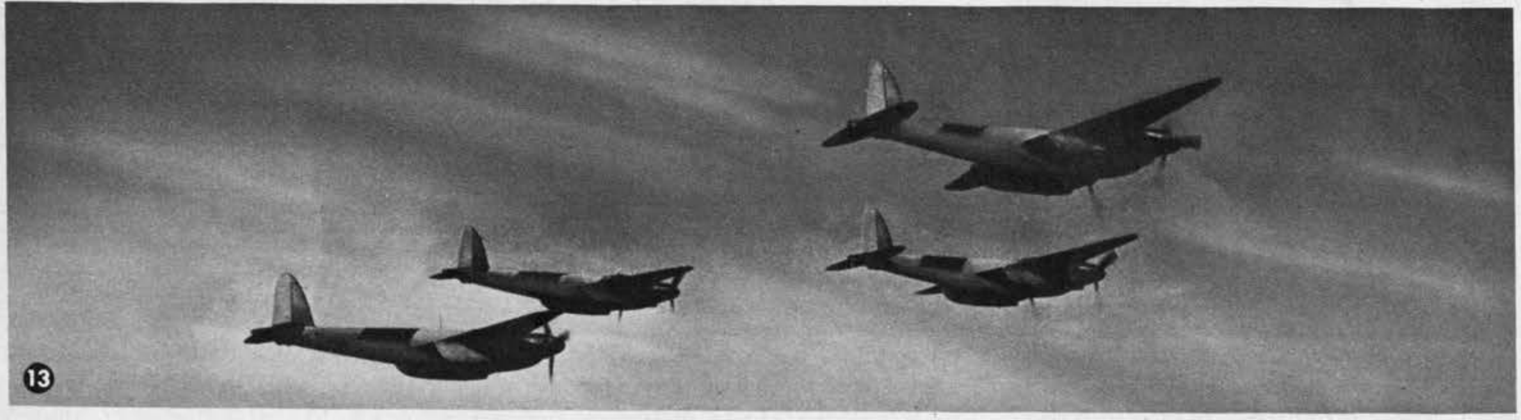
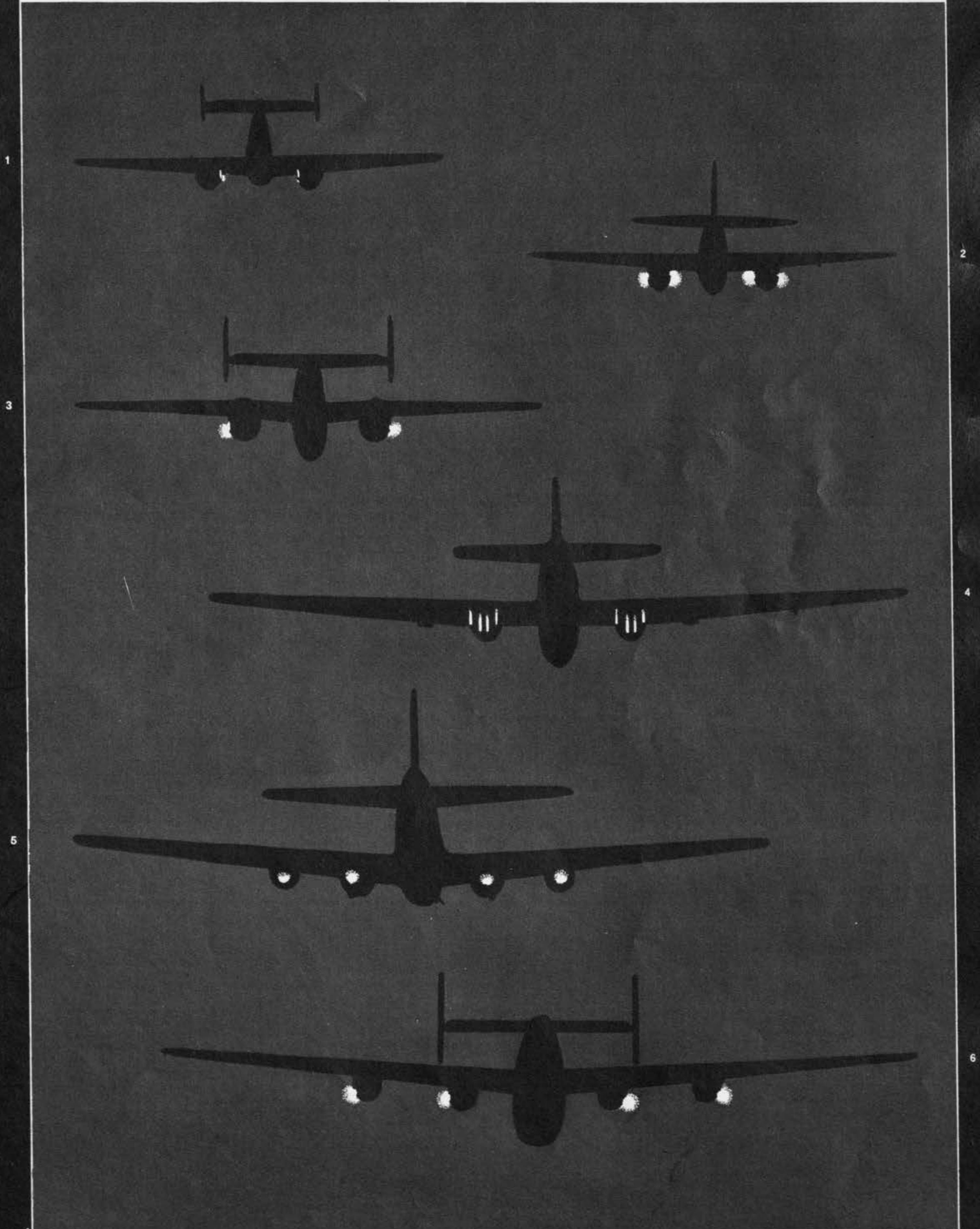

⑬

(For key to numbers, see p. 50)

# EXHAUST PATTERNS

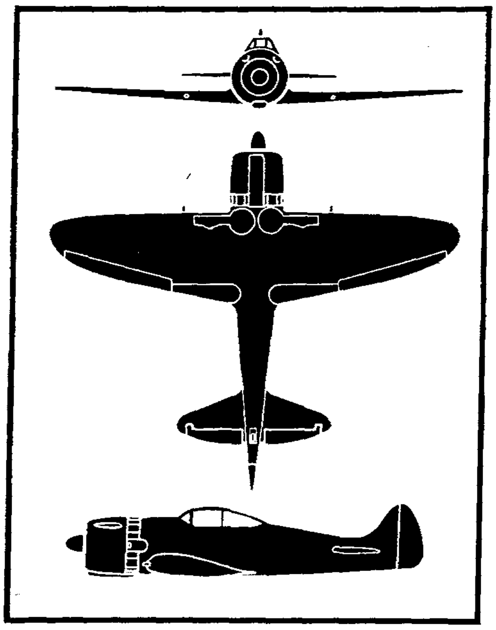
Shown here are results of an RAF study of exhaust flame patterns from 10° below astern. Trickiest of these six views is the owlish-looking Mosquito (No. 2) whose engines cast a bright flame on both sides. Odd pattern cast by He-177 (No. 4) shows four long light streaks formed by each engine, while the Me-110 (1) reveals engine exhaust only on the inside of each engine. B-25 (3) does the exact reverse and like the B-24 (6) throws its flame pattern only to the outside. The B-17 (5) is alone in this group in having exhaust position directly behind engines. Intended as an aid to recognition, it is important to note that these patterns reveal only the position of exhaust flames, not their intensity.



# NEWS & MISCELLANY

## NEW SILHOUETTE

A provisional silhouette of Japanese single-engine Tojo is given below. Tojo is a single radial-engine, low-wing monoplane. Wings resemble those of P-47 in plan view, have moderate dihedral. Broad wing, heavy engine, and short fuselage, give Tojo a stubby, compact appearance. The landing gear retracts inward. Tail plane is set unusually far forward of fin and rudder, providing an excellent recognition feature.



The smallest Jap fighter thus far encountered, Tojo mounts the most powerful engine yet found in any Jap SSF. Not quite so maneuverable as Zeke, it is faster, climbs and dives better. No protection is provided for pilot, fuel, or engine, and, when hit, Tojo explodes as spectacularly as did his predecessors. Armament consists of two synchronized 7.7-mm. MG in the fuselage and 1x12.7-mm. MG in each wing. Tojo is unique among Jap fighters in that it has a four-piece wing. This is a heavier construction than the usual Jap one-piece wing but should make Tojo easier to maintain.

## NEWS

The Ju-188 is a new type, fast medium bomber that was developed from the Ju-88B, which apparently was an intermediary model between the standard Ju-88A and Ju-188. The redesigned wings with increased span and completely new tail unit, compared with the Ju-88A, suggest an attempt to produce an aircraft with improved flying qualities, take-off and ceiling, particularly with heavy loads carried externally. This bomber is a twin-engine, low-wing monoplane. The tail unit is of a new design, the fin and rudder being both higher and wider than that of the Ju-88A and very square in general shape. Nose is redesigned for greater visibility and to accommodate increased armament.

●

Italian aircraft are in use at present by both the Germans and the Allies. Following is a list of Italian planes (for abbreviations see p. 6):

| | |
|---|---|
| Mc-200 | 1E-SSF |
| Mc-202 | 1E-SSF |
| Mc-205 | 1E-SSF |
| Re-2001 | 1E-SSF |
| Re-2005 | 1E-SSF |
| Cant-Z 1007 bis | 3E-HB, (T/B) |
| SM-79 | 3E-T/B(HB) |
| SM-82 | 3E-HB,(C) |
| SM-84 | 3E-HB,(T/B) |
| Cant-Z 506 B | 3E-F/B,(LB,R) |
| Cr-42 | 1E-SSF |
| G-50 | 1E-SSF |
| G-55 | 1E-SSF |
| Re-2000 | 1E-SSF |
| Ro-37 bis | 1E-LB,R |
| Ca-311 & Ca-312 bis | 2E-LB,R(T/B) |
| Rs-14 | 2E-F/B |
| P-108 | 4E-HB(T/B,C) |
| Br-20M | 2E-MB,(T/B) |
| Cant-Z 501B | 1E-F/B,(LB,R) |

●

Notice: The bottom of page 7 in the January issue of the *Journal* was removed by the U. S. Navy prior to distribution for security reasons.

## TRAINING AIDS

War Department Training Circular 131, Dec. 14, 1943 has been published outlining all the War Department training aids available for aircraft, naval vessel and armored vehicle, recognition training. Consult it for information on how to obtain these aids and the basis of issue to the Ground and Service Forces.

## CORRECTION

Slide number 883 bears the title "U. S. Army Transport, C-46—Lodestar 6/30/43." The title should be corrected to read "U. S. Army Transport Glider Tug, C-46—Commando 6/30/43."

## RECOGNITION COVERAGE IN NAVAL TRAINING COMMANDS

### Primary Training

| | |
|---|---|
| FLIGHT PREPARATORY SCHOOLS: | |
| U.S. NAVY PLANES | CLASS A |
| U.S. ARMY PLANES | CLASS A |
| BRITISH RAF PLANES | CLASS A |
| BRITISH FLEET AIR ARM | CLASS A |
| U.S. WARSHIPS | CLASSES A&B |
| PRE-FLIGHT SCHOOLS: | |
| JAPANESE PLANES | CLASS A |
| BRITISH WARSHIPS | CLASSES A&B |
| FRENCH WARSHIPS | CLASSES A&B |
| MERCHANT VESSEL TYPES | |
| PRIMARY TRAINING STATIONS | |
| GERMAN PLANES | CLASS A |
| JAPANESE WARSHIPS | CLASSES A&B |
| GERMAN WARSHIPS | CLASS A |
| LANDING CRAFT—U.S., JAPANESE & GERMAN | |

### Intermediate Training

Review of units introduced in Primary Training utilizing distant views of planes and warships. Introduction of planes and warships added to training lists while cadets are in Intermediate Training.

### Operational Training

OPERATIONAL TRAINING UNITS:

Selected review of units introduced in Primary and Intermediate Training; review of enemy planes to include performance and characteristics data.

NAVAL AIR GUNNERS SCHOOL:

Japanese, German and British fighter and attack bomber planes, and U. S. and Japanese warships as listed in Aviation Free Gunnery Central Standardization Committee Syllabus for Naval Air Gunners Schools and Aviation Free Gunnery Units.

### Technical Training

| | |
|---|---|
| U.S. NAVY PLANES: | CLASS A |
| U.S. ARMY PLANES: | CLASS A |

(Transports Excluded)

NOTE: Selected review in Operating Squadron covers planes and ships according to geographical areas and missions of personnel.

## QUIZ ANSWERS

### QUIZ No. 1

1. Beaufighter
2. Mosquito
3. Betty
4. Me-210
5. FW-190
6. Halifax
7. Typhoon
8. He-111
9. B-17
10. C-47
11. Lily
12. Ju-52
13. Ju-88
14. Ju-87D
15. Me-109F

### Quiz No. 2

1. Soviet T-34
2. German six-wheeled armored car
3. German PzKw VI, Tiger
4. Jap Medium Tank, 2597
5. Jap Light Armored Car, 2597
6. German PzKw III
7. German PzKw III (short "75")
8. British Bishop
9. German one-ton Armored Half Track
10. U. S. 105 mm. Howitzer Motor Carriage M-7
11. U. S. Medium Tank M-4
12. Soviet T-70 Light Tank

### QUIZ No. 3

1. Br. BB King George V Class
2. Jap CA Tone Class
3. Br. BB King George V Class
4. Br. CV Illustrious Class
5. Jap BB Kongo Class
6. U. S. Pass.-Cargo, LST, LCI
7. U. S. CA New Orleans Class
8. U. S. Modern Combination Passenger-Cargo
9. Br. BB Nelson Class (Rodney)
10. World War I—2 Freighters & Oiler
11. U. S. CVE Sangamon Class
12. U. S. 110-ft. SC
13. U. S. DD Livermore Class
14. U. S. CV Ranger—U. S. DD Livermore Class
15. U. S. DD Fletcher Class

### QUIZ No. 4

1. Warhawk P-40
2. Spitfire
3. Skytrain C-47
4. Mustang P-51
5. Airacobra P-39
6. Thunderbolt P-47
7. Boston A-20
8. He-111
9. Typhoon
10. Fortress
11. Sunderland
12. FW-200 C "Kurier"
13. Mosquito

## CREDITS

**The pictures used in the Journal, unless otherwise specified (*see below*) came from the Allied Armed Services.**

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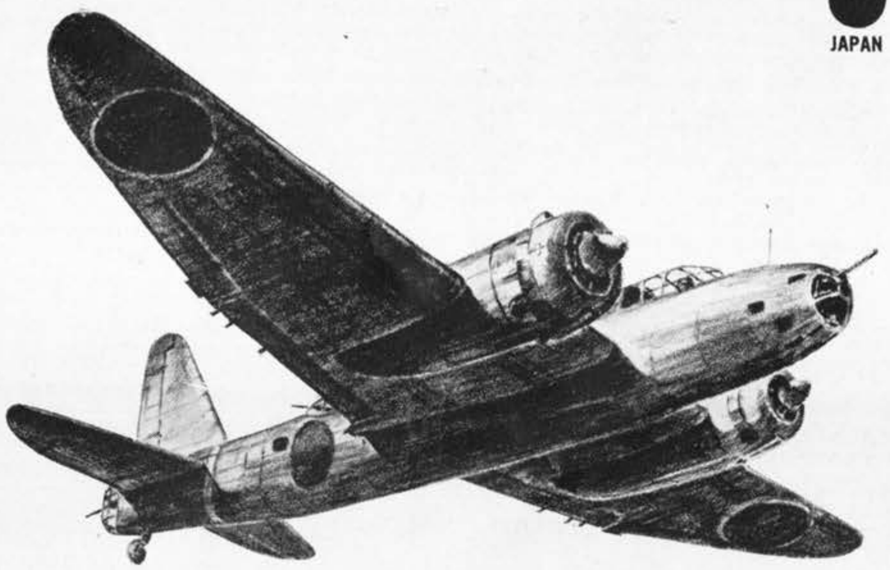
9—Hans Wild
11—Top, Graphic
14—Top, "The Aeroplane"
15—Bot., A.P.
20—Top, John Phillips
21—A.P.
22—Bot., A.P.
23—Top, W.W., cen., A.P.
24—Bot., Acme
33—Second row right, Bob Landry; third row center, Walter B. Lane; fourth row left, William C. Shrout; fourth row right, Myron H. Davis
37—Top, A.P.; bot. right, Int.
39—Top, J. R. Eyerman
40-41—Top, Myron H. Davis; bot., Sam Shere
42—Top, Myron H. Davis; bot. left and right, Sam Shere
43—Top, Bob Landry; bot., J. R. Eyerman
44—Bot., Sam Shere
45—Top, J. R. Eyerman
46—Dmitri Kessel
47—Bot. left, Ed Clark; bot. right, Dmitri Kessel
48—First row, Ralph Morse, William Vandivert, Eliot Elisofon
Second row left, North American Aviation Inc.; right, Frank Scherschel
Third row, Ralph Morse, Frank Scherschel, Acme
Fourth row center, William Vandivert
Abbreviations: A.P., Associated Press; W.W., Wide World; Int., International

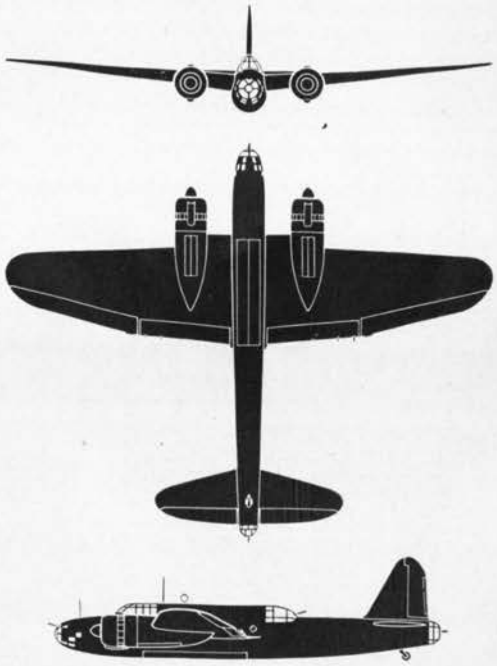
MEDIUM BOMBER

JAPAN

# "HELEN," T-100 M/B



PROVISIONAL SKETCH



PROVISIONAL SILHOUETTE

**DISTINGUISHING FEATURES:** Twin-engine mid-wing monoplane. Leading edge inboard of the engines is farther forward than outer section, like the Mosquito. Trailing edge of the wing has a broken taper ending in a broad rounded tip. Radial engines are underslung. Fuselage decreases in size only slightly toward tail section, terminating in gun position. Span is about 68 ft.

**INTEREST:** Though this plane has been known to be in production for some time, it is now appearing in operation over India, Australia, and Southwest Pacific areas. The remains of a few crashed Helen's have been examined, and recently this plane has been photographed from the air. Results to date have been insufficient for a satisfactory calculation of its performance.

**SPAN:** approx. 68 ft.
**LENGTH:** approx. 54 ft.
**APPROX. MAX. SPEED:** 270—80 m.p.h.
**SERVICE CEILING:** 35,000 ft. (Max.) estimated, 30,000 ft. (Normal)

JAN. 1, 1944
FROM DATA CURRENTLY AVAILABLE

WAR DEPARTMENT FM 30-30
NAVY DEPARTMENT BUAER 3

RESTRICTED

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**NOTE:** This page is to be cut along dotted lines (*above* and *below*), added to the proper nation's section in the Recognition Pictorial Manual. The dots indicate perforations.

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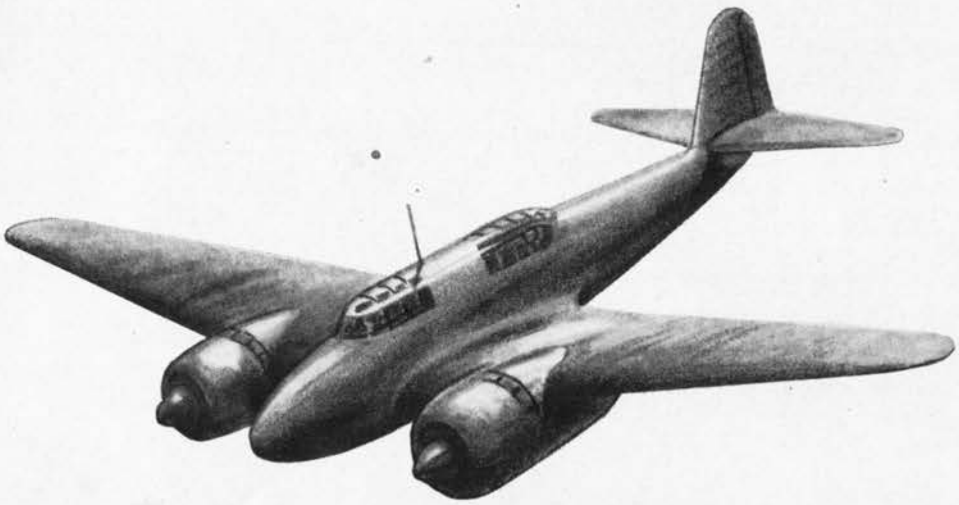
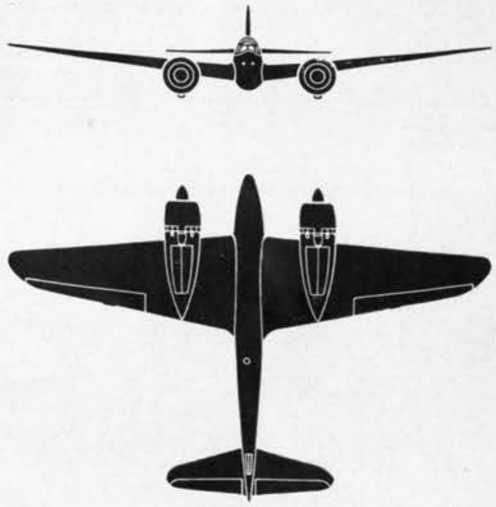
FIGHTER

JAPAN

# "NICK," Type 2



PROVISIONAL SKETCH



PROVISIONAL SILHOUETTE

**DISTINGUISHING FEATURES:** Twin-engine low mid-wing monoplane. Engines are underslung with a deep nacelle continuing back under the wing to the trailing edge. The fuselage is unusually slender and streamlined from pointed nose to tail. The wing, engines, greenhouse, and tail closely resemble those of Lily.

**INTEREST:** This airplane has been reported operating in the Southwest Pacific area for the last few months. Very little was known about it until some recent photographic data was secured by our attacking aircraft. Nick is now recognized as an operational plane and will probably be seen in increasing numbers.

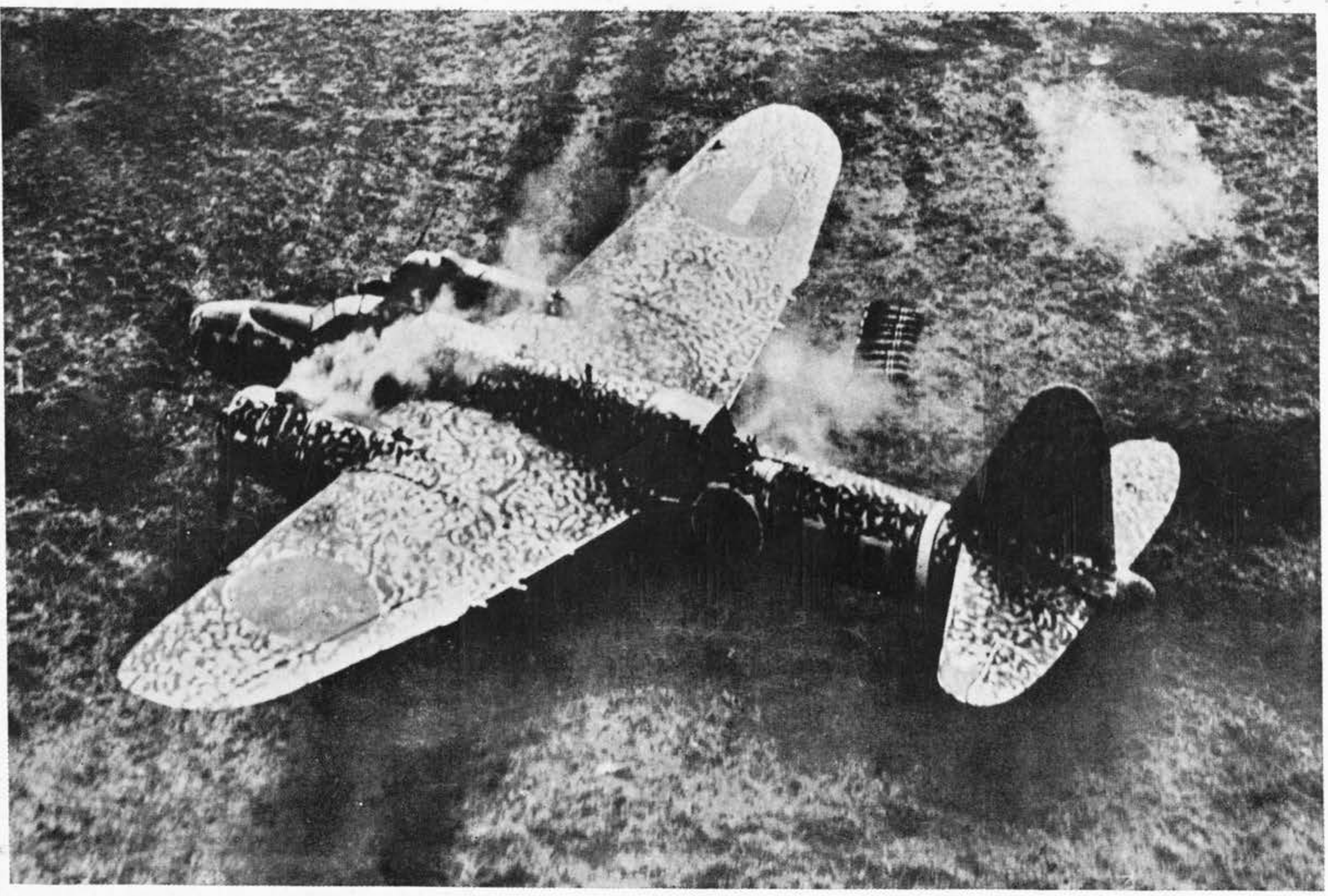
**SPAN:** 50 ft. approx.
**LENGTH:** 34 ft. approx.
**APPROX. MAX. SPEED:** 350 m.p.h. at 17,600 ft.
**SERVICE CEILING:** 35,400 ft. (Normal wt.)

JAN. 1, 1944
FROM DATA CURRENTLY AVAILABLE

WAR DEPARTMENT FM 30-30
NAVY DEPARTMENT BUAER 3

RESTRICTED

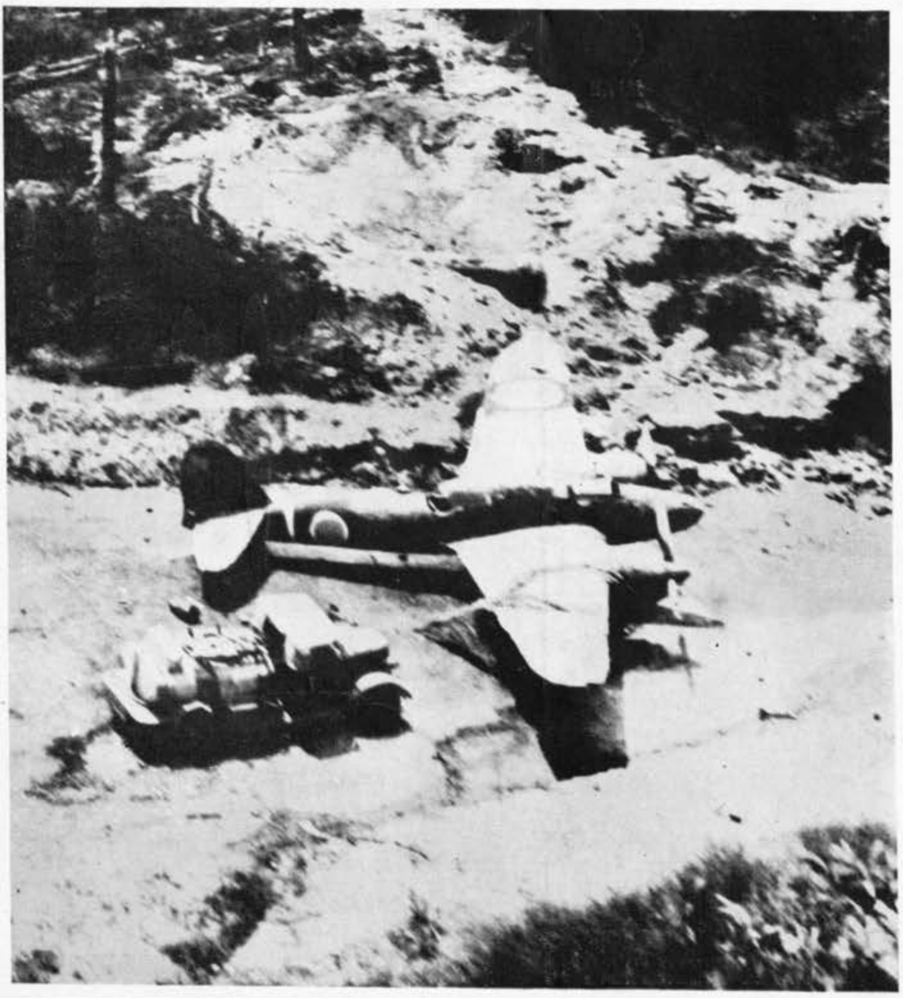
A



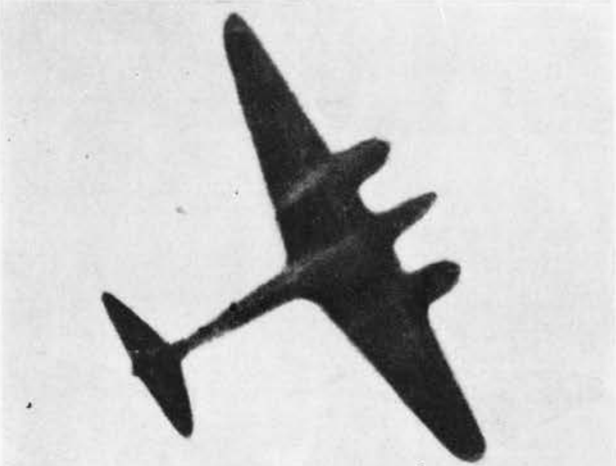
**HELEN,** one of latest operational Japanese twin-engine airplanes, has wingspan and armament of a medium bomber, but performance details are undetermined. Helen is distinguished by broken line of wing's trailing edge; leading edge projection between nacelles.

**NICK** was recently photographed in an Army Air Forces raid on Wewak (see *Journal*, Nov. issue). While a fighter version of Dinah has been reported for some time, Nick is the only Japanese twin-engine fighter so far definitely established as being operational.

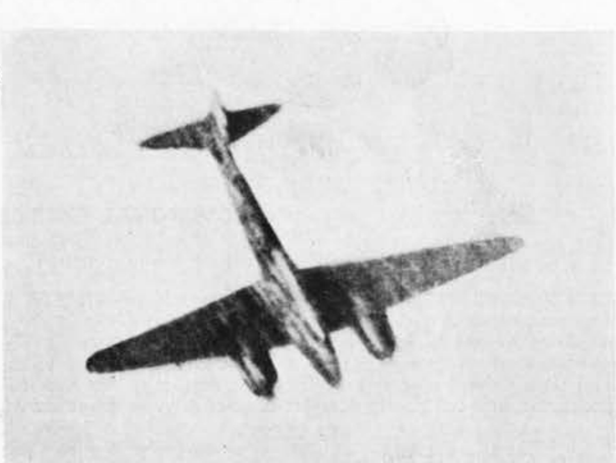
A



B



C



U. S. ARMY-NAVY JOURNAL OF

# RECOGNITION

LOW-LEVEL ATTACK

MARCH, 1944
NUMBER 7

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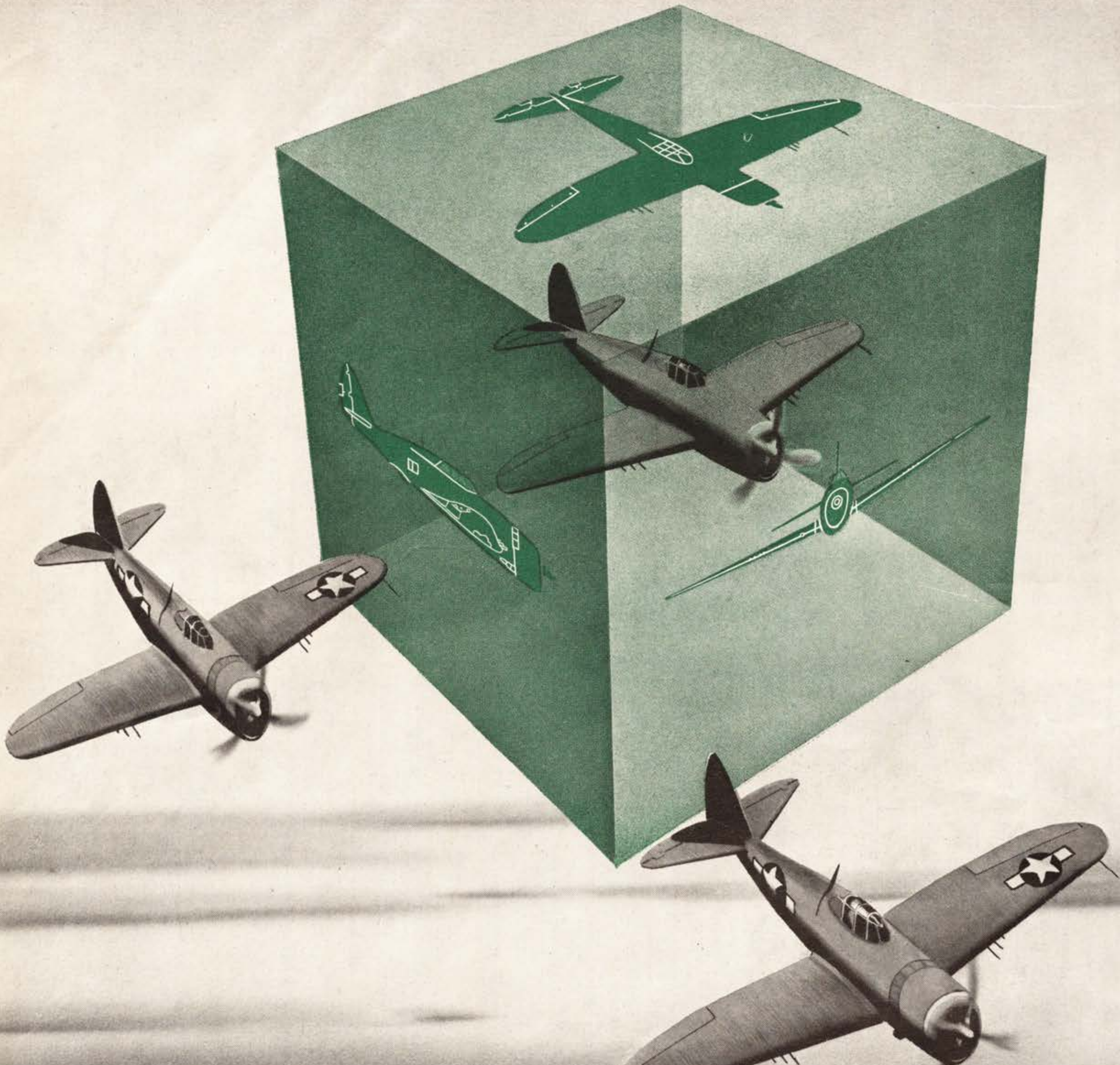

P-47 CAUGHT SQUARELY IN A TRANSLUCENT CUBE SHOWS HOW THE THREE ELEVATIONS OF THE SILHOUETTES INTEGRATE TO MAKE THE TOTAL FORM OF THE AIRPLANE

U. S. ARMY-NAVY JOURNAL OF

RECOGNITION

MARCH, 1944

NUMBER 7

PUBLISHED BY THE U.S. WAR AND NAVY DEPARTMENTS

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# SILHOUETTES

The silhouette, one of the oldest art forms known to man, is an integral enough part of the teaching scheme in recognition so as to be considered the most important single step in knowing airplanes. Probably the most widely used training device, the silhouette was first used to teach recognition during World War I when both the Germans and the Allies got out booklets with crude drawings of airplanes, sometimes grossly inaccurate. As one of a series of articles on training the *Journal* this month reports on the theory and application of the silhouette.

The two-color rendering on the opposite page of three P-47's in flight is an attempt to show graphically just what the relationship of the silhouette to the airplane really is. There are two methods by which this relationship can be defined: 1) the airplane in the center of the cube is an inner projection of the three basic elevations on the faces of the cube; 2) the three silhouettes might also be considered flat projections of the airplane's total form, greatly simplified for teaching purposes. Whatever the derivation, the fact is plain that they go together. Because the silhouette does have such wide use, it has been standardized until now only three elevations are taught: head-on, side and plan view (*see below*).

Since it is an elementary device it must be remembered that the silhouette is actually nothing more than a blueprint. To an untrained beginner the silhouette might seem to be rather dull compared to a photograph but it conveys the general appearance of the subject, gives precise outlines of specific sections of the airframe, locates them and shows their relative size. And since it is impossible to provide photographs showing the thousands of different angles of flight, the use of the three basic elevations of the silhouette makes the handiest working substitute. They do not, however, pretend to look like an airplane in flight. In short, the silhouette is a set of permanent notes on the appearance of the airplane and should be used as such.

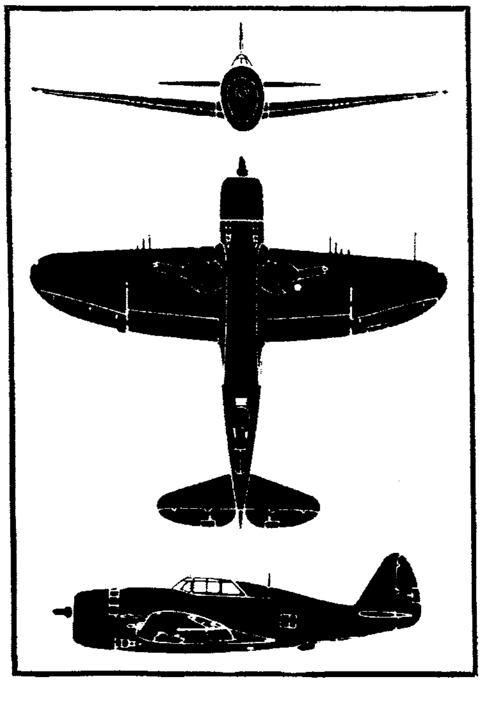
Without any doubt the best way to get to know an airplane is to watch it in flight and study it from various angles. There are, to be sure, certain artificial aids like the sillograph (*see quiz, p. 51*) and the shadowgraph (*see Journal, Feb. issue*) which do give the illusion of the airplane's total form in the air. However, they, as well as the silhouette, have rigid limitations and must be considered only supplemental methods.

The artist's dramatized interpretation of the two concepts of the silhouette on the opposite page shows the student or observer the visualizing process which must take place bridging the gap between the two-dimensional silhouette and the three-dimensional airplane. To a beginner this might at first be difficult. However, with practice it soon becomes possible to build an accurate picture of the airplane in almost any attitude of flight. In the silhouette there are several weaknesses, such as optical illusions (*see Journal, Feb. issue*) which do limit its function.

## It Has Many Uses

Despite such limitations, though, the silhouette has an important and definite place in recognition. Although some people might have difficulty in working with blueprints or silhouettes, once they understand the process of visualization illustrated by the cube opposite, the silhouette can become quite as adequate an aid as a model or even a picture in some cases. The silhouette also can be used quite handily as a refresher to keep the observer constantly aware of any airplane's appearance. Moreover, the silhouette does give the essential facts about airplanes; when a new type is being studied there is no better way to show its specific details.

Like all training aids the silhouette is best used when it supplements other training devices as part of an integrated program and when it is not used incorrectly to teach certain phases which could best be taught by other means. For example, the shadowgraph and the sillograph are eminently more suited for testing recognition than the silhouette. The silhouette, on the other hand, is the best way to show the undistorted detailed view of an airplane. When properly employed the silhouette is not only a major foundation in the first stages of teaching recognition, it is by far the best reference source for the entire subject.

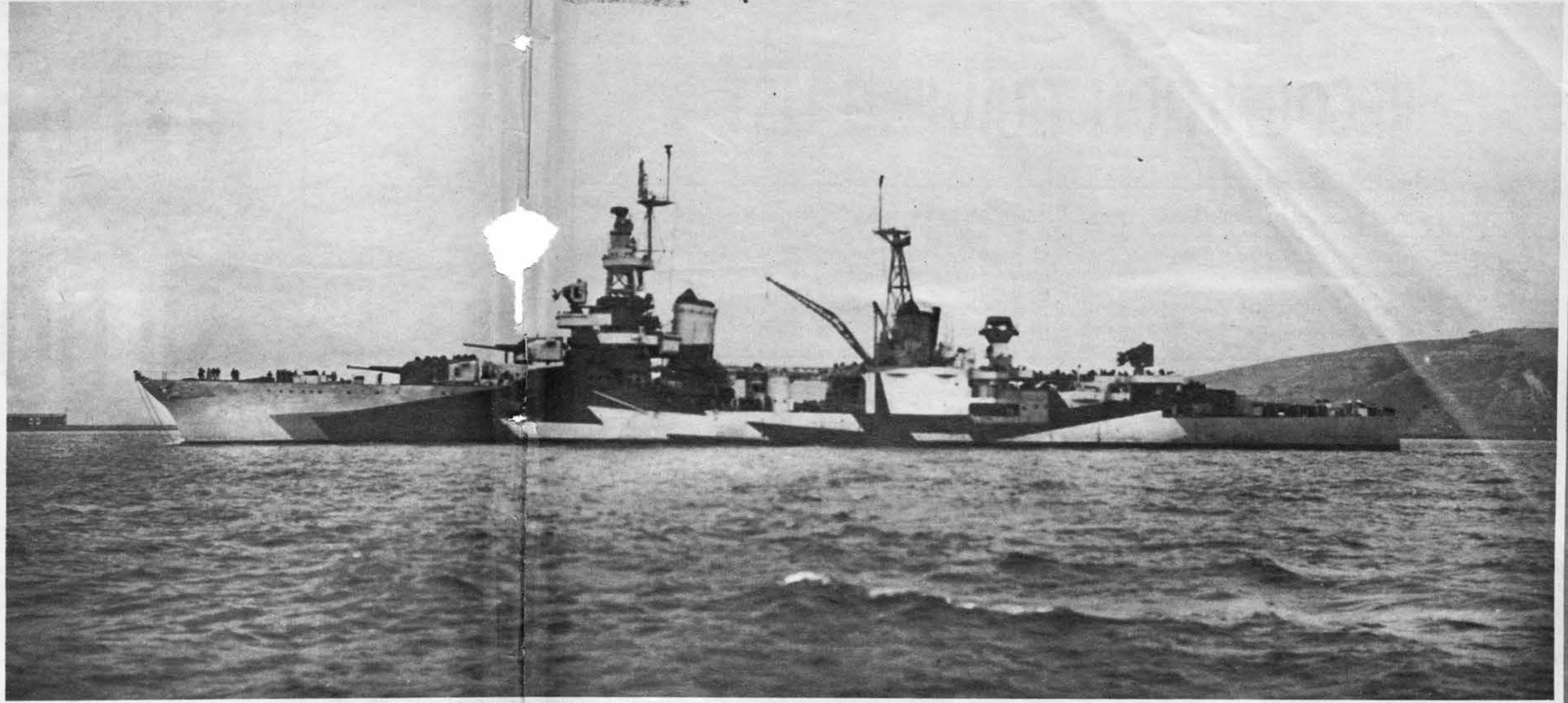


# HEAVY CRUISERS CHANGE SHAPES

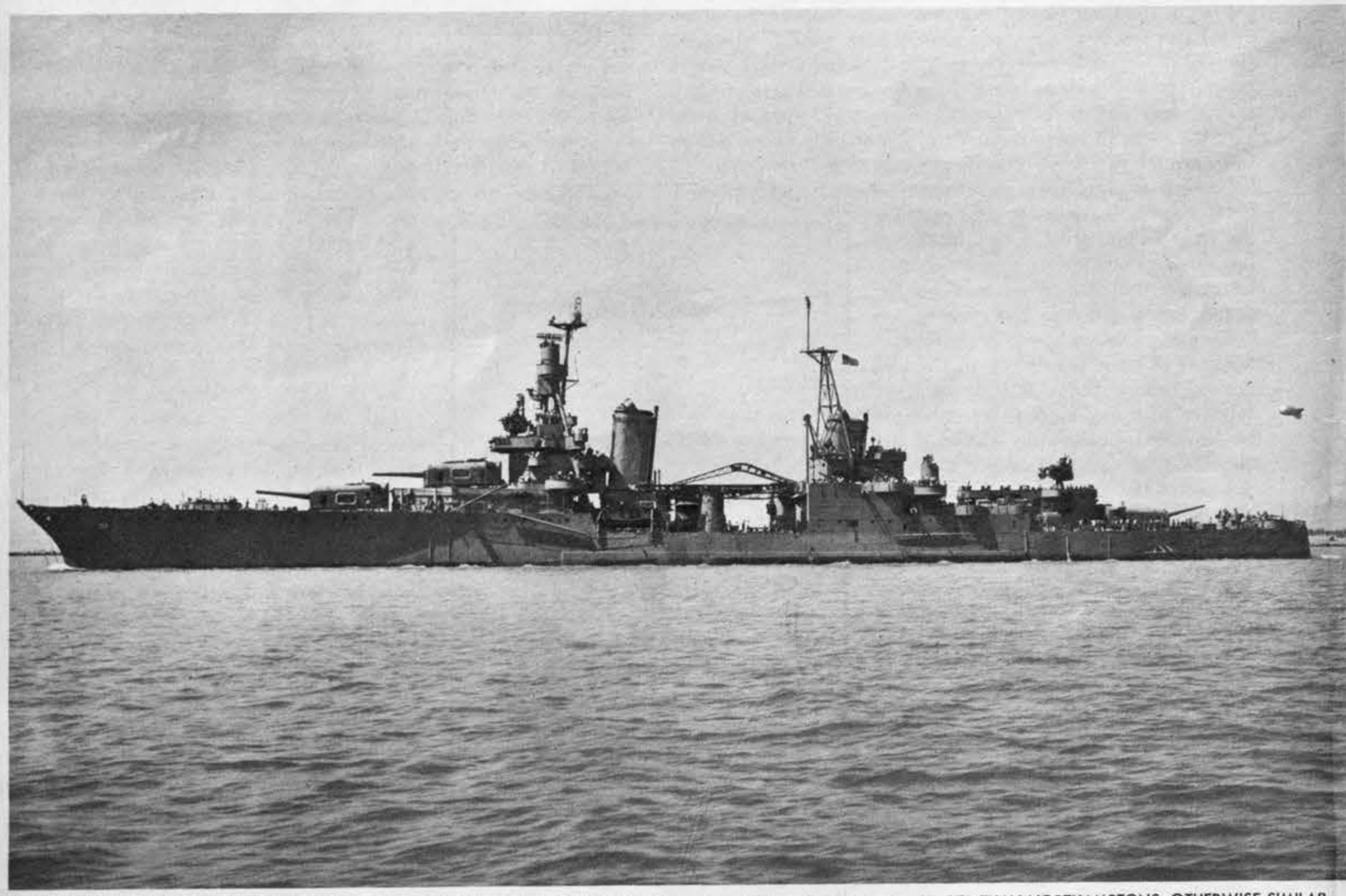
Recent changes in the appearance of the Northampton CA's are proof that the ship-vs.-air warfare question is far from being resolved. Addition of protective AA firepower to these cruisers has occasioned the striking of many less important superstructure elements to allow the added flak the widest possible arc of fire. Thus as the airplane increases its offensive strength against the warship, the warship undergoes radical modification to meet the augmented threat.

The 9,300-ton Northampton cruisers, all fitted as flagships, were completed in 1930–31. They have the same basic design as the later 9,800-ton Portland's which were the last of the 10,000-ton limit Washington Treaty cruisers, commissioned in 1932. Until lately they showed widely scattered superstructure elements, easily recognizable straight lines. They still have two short raking flat-sided stacks separated by a catapult well-deck, with the catapults set high. No. 2 stack is partly hidden by a big 4-plane hangar structure. Deckline is broken amidships—at the catapult in the Augusta, at the foremast in the other units. They have two triple 8-in. gun turrets forward, one aft; tall tripod mainmast.

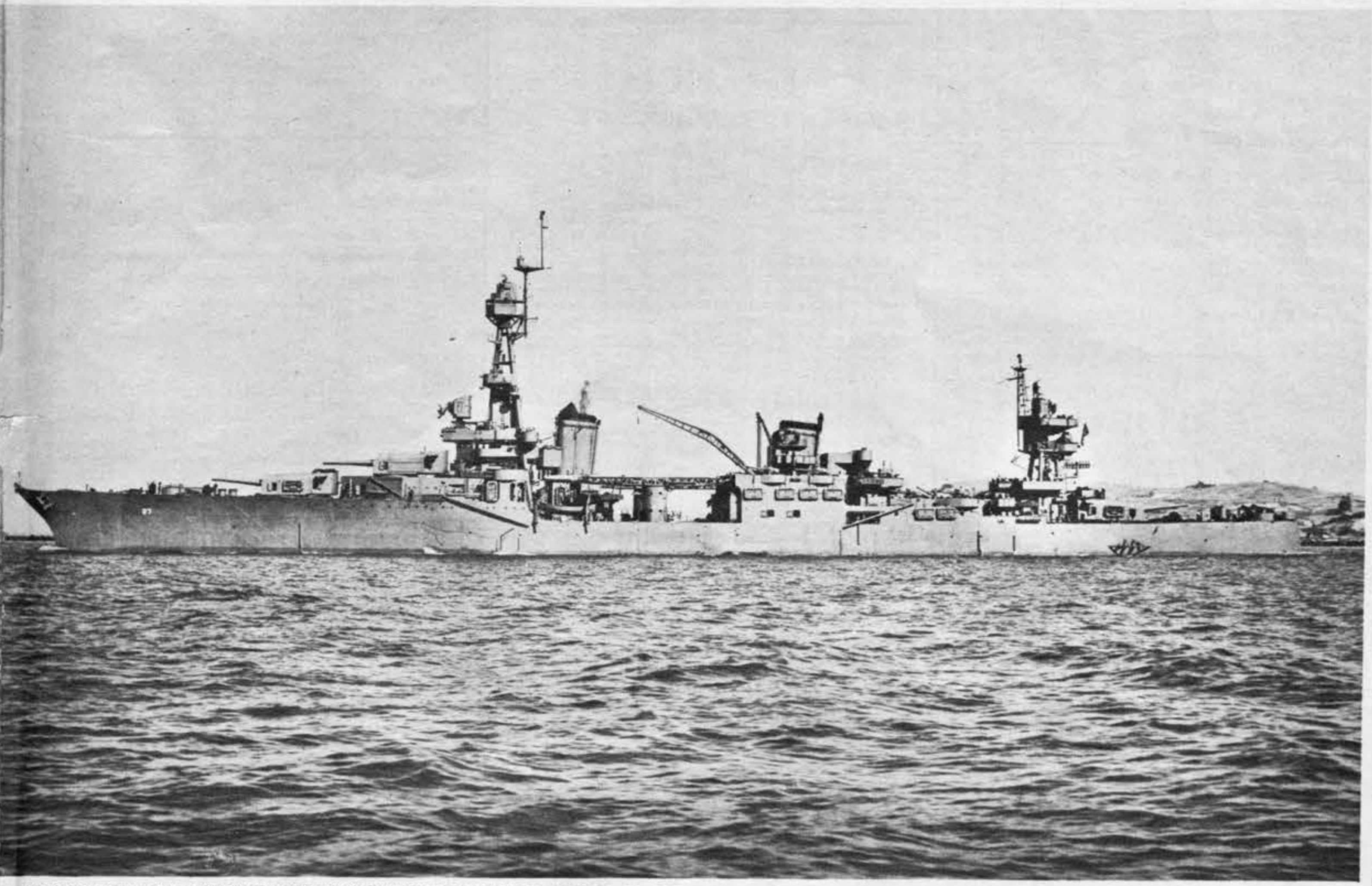
The changes now being effected in the Northampton Class ships have already been made and tested on the Portlands. In both cases the problem was much the same: removal of the mainmast elements from the quarterdeck; erecting a light tripod at the aft stack; and the mounting of additional 20-mm. and 40-mm. AA aft. A new fire director was fitted abaft the No. 2 stack to replace fire-control elements removed with the stump tower.



WEARING NAVY'S NEW PACIFIC CAMOUFLAGE, A REFITTED NORTHAMPTON LIES AT ANCHOR. COMPARED WITH THE PHOTO BELOW, SILHOUETTE ABAFT STACK SHOWS CHANGE FROM SCATTERED SUPERSTRUCTURE TO GREATER CONCENTRATION AMIDSHIPS



REFITTED INDIANAPOLIS SHOWS CURRENT APPEARANCE OF UNITS OF THE PORTLAND CLASS. PORTLANDS ARE 10 FT. LONGER THAN NORTHAMPTONS, OTHERWISE SIMILAR



OLD RIG OF NORTHAMPTON CLASS IS SHOWN BY PHOTO OF U.S.S. CHESTER. CHESTER WILL PROBABLY BE MODIFIED TO RESEMBLE OTHER NORTHAMPTONS AND PORTLANDS

# RECOGNITION TRAINING LIST

The following Navy Recognition Training List is designed to simplify recognition of surface craft. It is basically the same as that contained in the November *Journal* but similar ships of the same type are combined for recognition purposes.

The ships listed under Class A are the most important from a numerical or operational standpoint; hence, they form the "must" list for all study of surface craft recognition. Class B ships are less important and should be taken up when the Class A list is known thoroughly, or in areas where the full line-up of a particular navy may be encountered. Where the word "Class" appears after the ship name, it indicates that more than one unit of similar structure and appearance exists. Where only the ship name is given, it is a single unit.

## UNITED STATES

| CLASS A | CLASS B |
|---|---|
| I. Battleships: (BB) | |
| a. NEW YORK Class—ARKANSAS | |
| b. PENNSYLVANIA | |
| c. NEW MEXICO Class | |
| d. TENNESSEE Class | |
| e. NORTH CAROLINA Class | |
| f. SOUTH DAKOTA Class | |
| g. IOWA Class | |
| | h. NEVADA |
| | i. COLORADO Class |
| II. Aircraft Carriers: (CV) | |
| a. ESSEX Class | |
| b. ENTERPRISE | |
| c. SARATOGA | |
| | d. RANGER |
| III. Aircraft Carriers, Light: (CVL) | |
| a. INDEPENDENCE Class | |
| IV. Aircraft Carriers, Escort: (CVE) | |
| a. BOGUE-SANGAMON-CASABLANCA Classes | |
| V. Heavy Cruisers: (CA) | |
| a. NORTHAMPTON-PORTLAND-PENSACOLA Classes | |
| b. NEW ORLEANS Class | |
| c. BALTIMORE Class | |
| | d. WICHITA |
| VI. Light Cruisers: (CL) | |
| a. OMAHA Class | |
| b. BROOKLYN Class—ST. LOUIS | |
| c. CLEVELAND Class | |
| | d. ATLANTA Class |
| VII. Destroyers: (DD) | |
| a. "Old Flush-Deckers" | |
| b. GRIDLEY-BAGLEY-BENHAM-SIMS-SOMERS Classes | |
| c. BENSON-LIVERMORE-MAHAN-DUNLAP-PORTER Classes | |
| d. FLETCHER Class | |
| e. Destroyer Escorts (DE-51 and DE-1 Classes) | |
| | f. FARRAGUT Class |

## BRITISH

| CLASS A | CLASS B |
|---|---|
| I. Battleships: (BB) | |
| a. ROYAL SOVEREIGN Class—MALAYA | |
| b. QUEEN ELIZABETH-VALIANT-WARSPITE | |
| c. NELSON Class | |
| d. KING GEORGE V Class | |
| | e. RENOWN |
| II. Aircraft Carriers: (CV) | |
| a. FURIOUS | |
| b. ILLUSTRIOUS Class | |
| III. Auxiliary Aircraft Carriers: (CVE) | |
| a. UNICORN | |
| b. BATTLER-ARCHER Classes—ACTIVITY | |
| IV. Heavy Cruisers: (CA) | |
| a. LONDON | |
| b. KENT-DEVONSHIRE Classes—NORFOLK | |
| | c. HAWKINS Class |
| V. Light Cruisers: (CL) | |
| a. DRAGON-CARLISLE-CALEDON Classes | |
| b. EMERALD Class | |
| c. LEANDER Class | |
| d. ARETHUSA Class—HOBART | |
| e. DIDO Classes | |
| f. FIJI-SOUTHAMPTON Classes | |
| | g. BELFAST |
| | h. ADVENTURE |
| | i. ADELAIDE |
| VI. Destroyers: (DD) | |
| a. "Town" Class | |
| b. "V-W" Classes—"Wairs" | |
| c. "A" to "I"—WALLACE-DOUGLAS-SAGUENAY-CODRINGTON Classes | |
| d. "J" to "T"—"Hunt" Classes | |
| | e. "Tribal" Class |

NOTE BB: MALAYA of the QUEEN ELIZABETH Class combined for recognition training purposes with ROYAL SOVEREIGN Class.

NOTE CVE: BATTLER Class same as BOGUE Class; ARCHER Class almost identical to CHARGER; ARCHER herself has no island superstructure.

NOTE CL: BELFAST an "improved SOUTHAMPTON"; ADELAIDE a Royal Australian Navy unit.

NOTE DD: Thornycroft Leaders may be included in "V-W" Classes combination; some of the "V-W" Classes have first stack removed. Admiralty "S" may be included in "A" to "I" Classes.

## FRENCH

| CLASS A | CLASS B |
|---|---|
| I. Battleships: (BB) | |
| a. RICHELIEU | |
| II. Light Cruisers: (CL) | |
| a. LA GALISSONNIERE Classes | |
| | b. EMILE BERTIN |
| | c. JEANNE D'ARC |
| III. Destroyers: (DD) | |
| a. LE FANTASQUE | |

NOTE: Instruction in other French vessels should be postponed pending receipt of up-to-date information, both as to appearance and prospective operating status.

## JAPANESE

| CLASS A | CLASS B |
|---|---|
| I. Battleships: (BB) | |
| a. KONGO Class | |
| b. FUSO Class | |
| c. ISE Class | |
| d. NAGATO Class | |
| II. Aircraft Carriers: (CV) | |
| a. SHOKAKU Class | |
| | b. HOSHO |
| III. Aircraft Carriers, Escort: (CVE) | |
| a. UNYO-OTAKA | |
| IV. Heavy Cruisers: (CA) | |
| a. NACHI-AOBA Classes | |
| b. ATAGO Class—CHOKAI-MAYA | |
| c. MOGAMI Class | |
| | d. TONE Class |
| V. Light Cruisers: (CL) | |
| a. SENDAI Class | |
| b. KUMA-NATORI-TENRYU Classes | |
| | c. YUBARI |
| | d. KATORI Class |
| VI. Destroyers: (DD) | |
| a. MUTSUKI-KAMIKAZE-MINEKAZE-WAKATAKE-MOMI Classes | |
| b. FUBUKI-SHIGURE-HATSUHARU-ASASHIO Classes | |
| c. TERUTSUKI Class | |
| | d. CHIDORI-OTORI Classes |

NOTE CV, CVE: Existence of other CV's and CVE's known; recognition information inadequate.

NOTE DD: FUBUKI Class includes AMAGIRI, SHINONOME and HIBIKI Groups. CHIDORI-OTORI Classes (TB's) are the counterpart in Japanese Navy of U. S. Destroyer Escorts.

## GERMAN

| CLASS A | CLASS B |
|---|---|
| I. Battleships: (BB) | |
| a. TIRPITZ | |
| II. Heavy Cruisers: (CA) | |
| a. ADMIRAL HIPPER-PRINZ EUGEN | |
| b. ADMIRAL SCHEER-LÜTZOW | |
| III. Light Cruisers: (CL) | |
| a. KÖLN-EMDEN | |
| b. NÜRNBERG-LEIPZIG | |
| IV. Destroyers: (DD) | |
| a. "Narvik"—MAASZ—WOLF-MÖWE—ROEDER Classes | |
| b. "T" Series (TB) | |
| c. New "M" Series (AM) | |

NOTE DD: "T" Series (TB) and New "M" Series (AM) included on list until such time as a separate training list is prepared for minor combatant types. ELBING Class in commission; no reliable pictorial material available.

## ITALIAN

NOTE: Instruction in Italian surface craft postponed, pending receipt of up-to-date information, both as to appearance and prospective operating status.

### MERCHANT VESSEL TYPES

I. Passenger Liner
II. Passenger-Cargo Liner
III. Cargo Ship
IV. Tanker
V. Whaler
VI. Collier

NOTE (1): Merchant vessels of all nations included under the above types.
(2): Further breakdown in merchant vessel classification is not feasible.
(3): Larger naval auxiliaries being similar to merchant vessels are classified as such.

### LANDING CRAFT

U. S.

I. Landing Ship, Tank (LST)
II. Landing Ship, Dock (LSD)
III. Landing Craft, Infantry (LCI)
IV. Landing Craft, Tank (LCT)
V. Landing Craft, Mechanized (LCM)
VI. Landing Craft, Support (LCS)
VII. Landing Craft, Control (LCC)
VIII. Landing Craft, Vehicle and Personnel (LCVP)
IX. Landing Vehicle, Tracked and Landing Vehicle, Tracked (Armored)—(LVT and LVT(A))
X. Duck—2½ Ton Amphibian Truck

Japanese

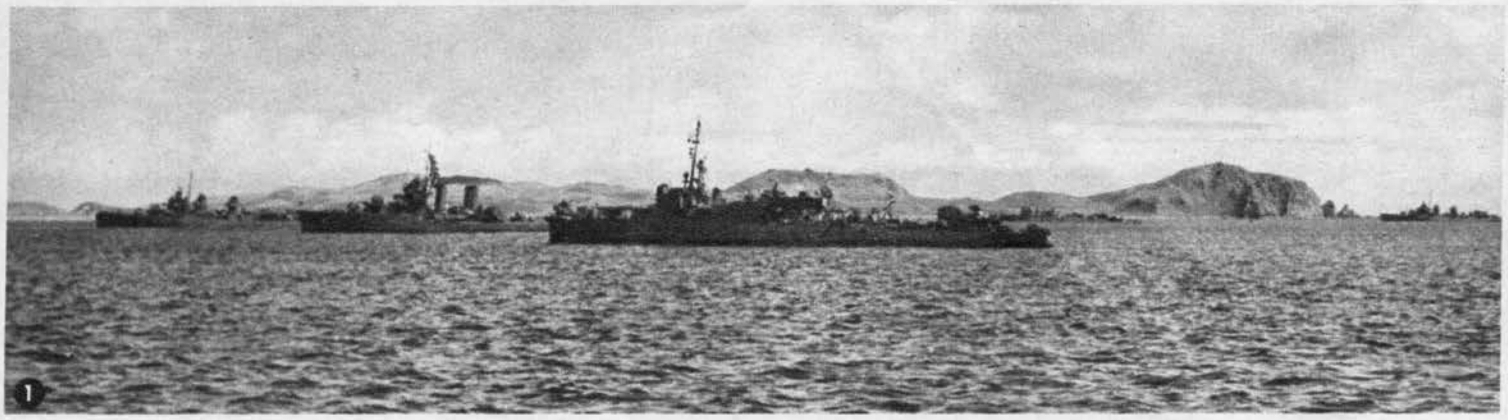
I. Type A
II. Type B
III. Type C
IV. Type D
V. Type E
VI. Type F
VII. Type G
VIII. Landing Craft Carrier

German

I. Siebel Ferry
II. Tank Landing Craft (TLC)

NOTE: Numerous other German landing craft are mostly commercial craft adapted to war uses without much alteration.

# QUIZ NO. 1: SHIPS IN SILHOUETTE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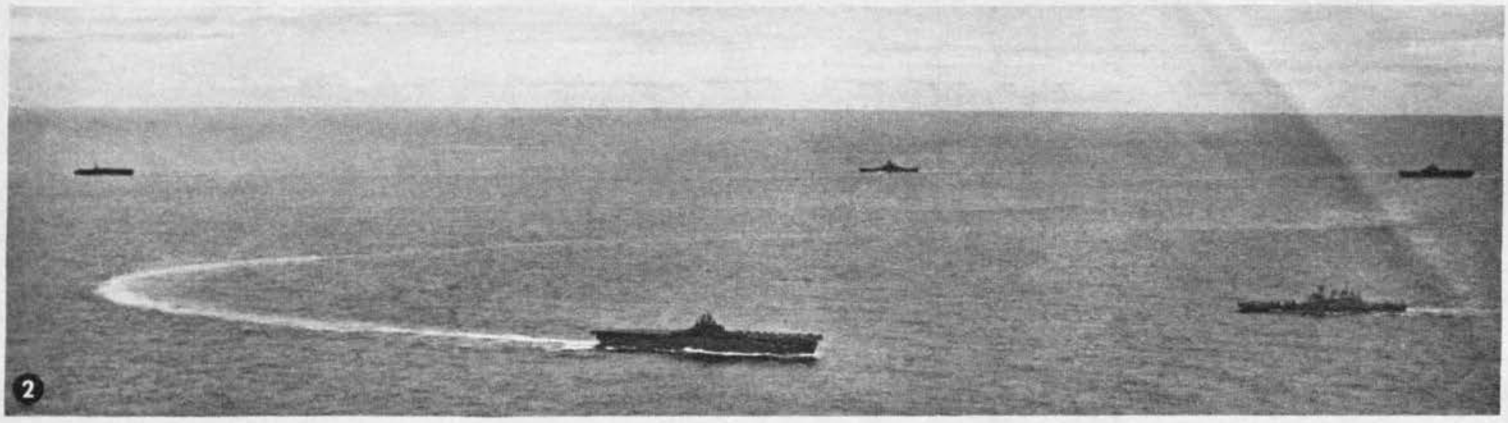
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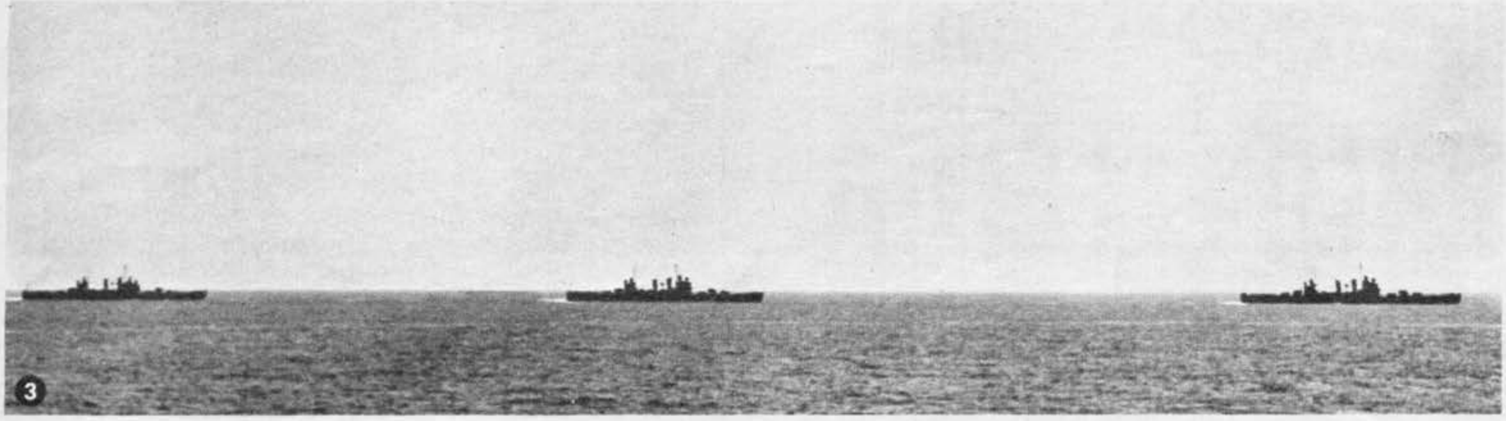
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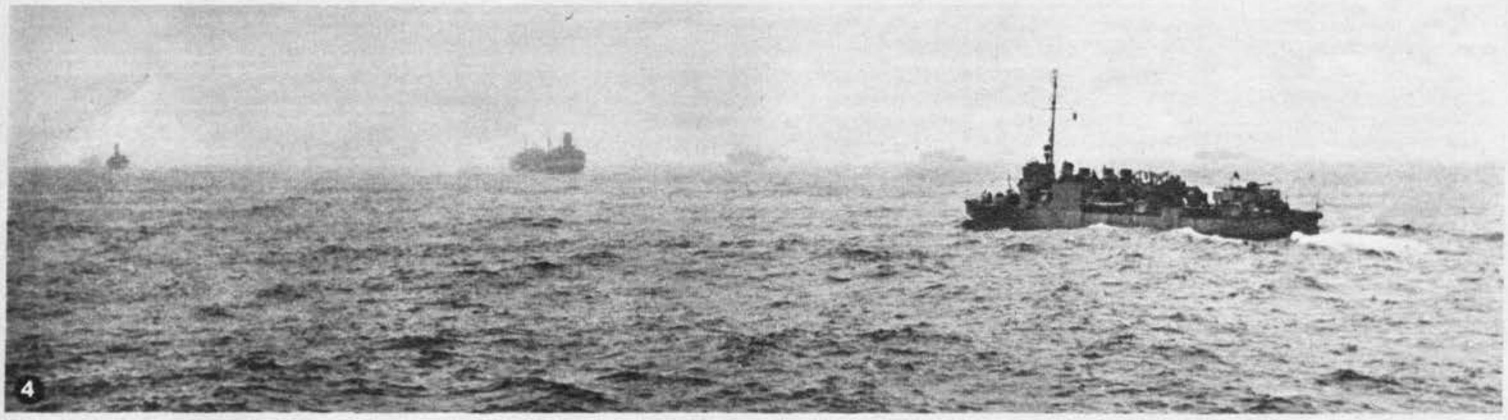
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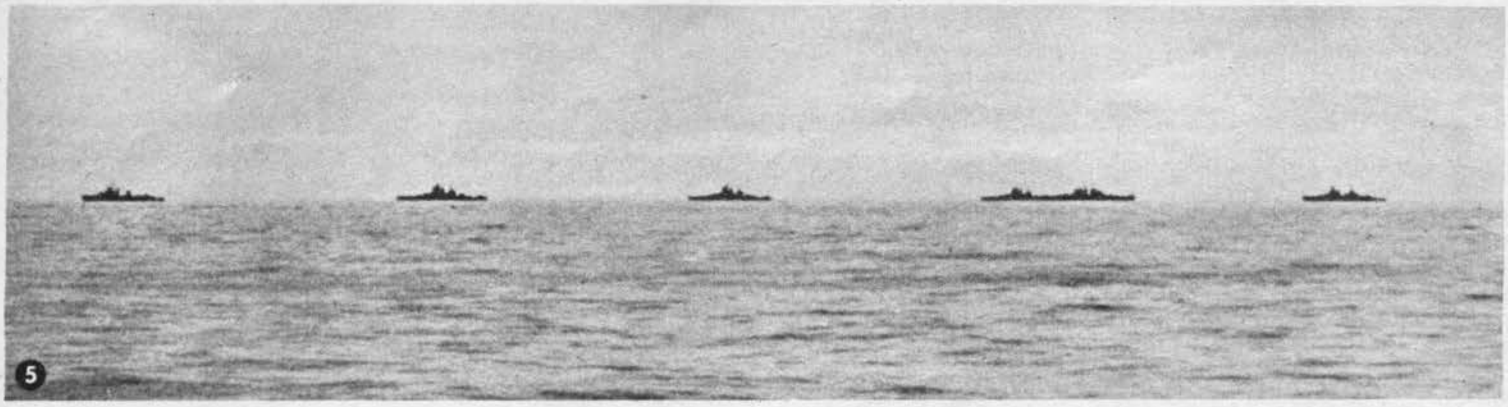
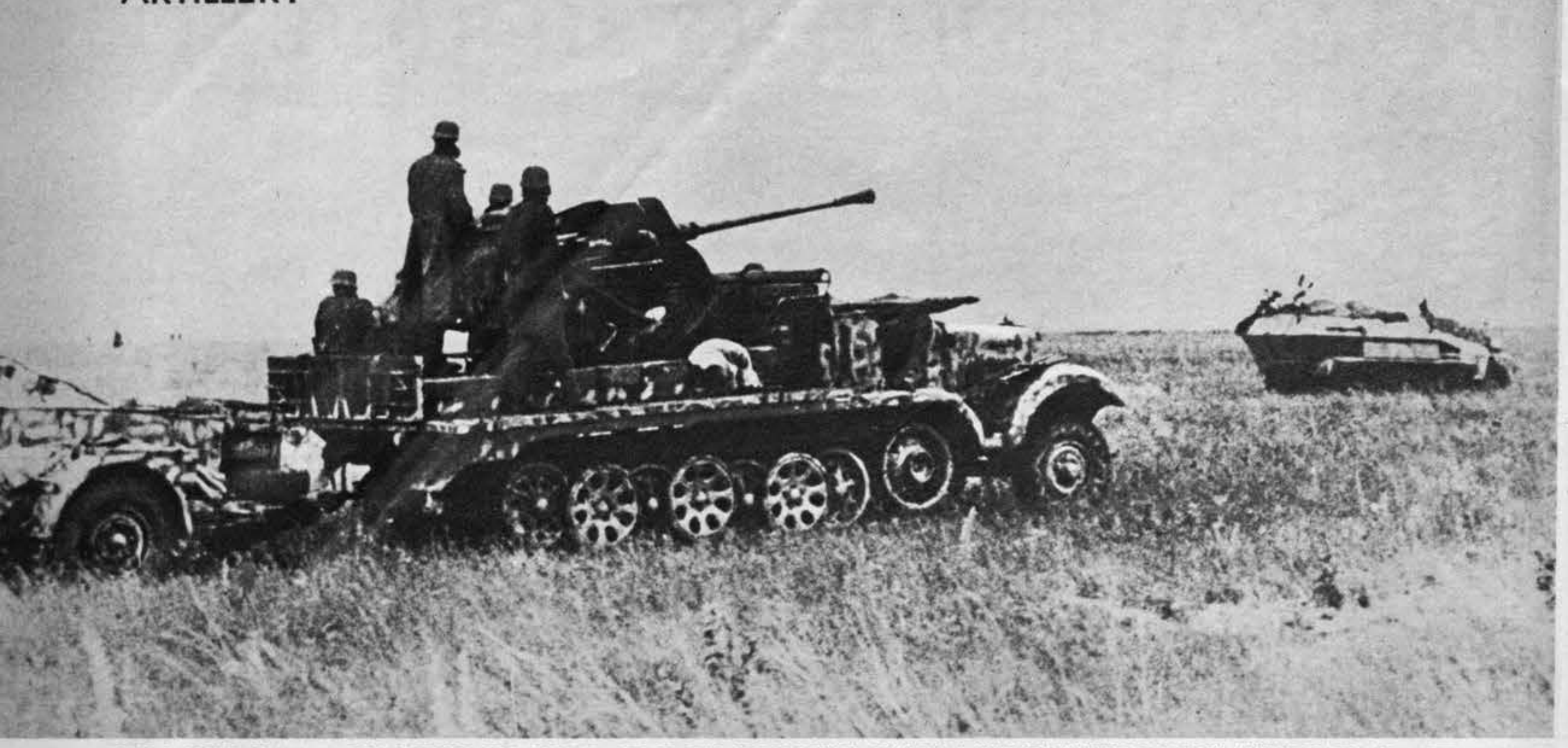
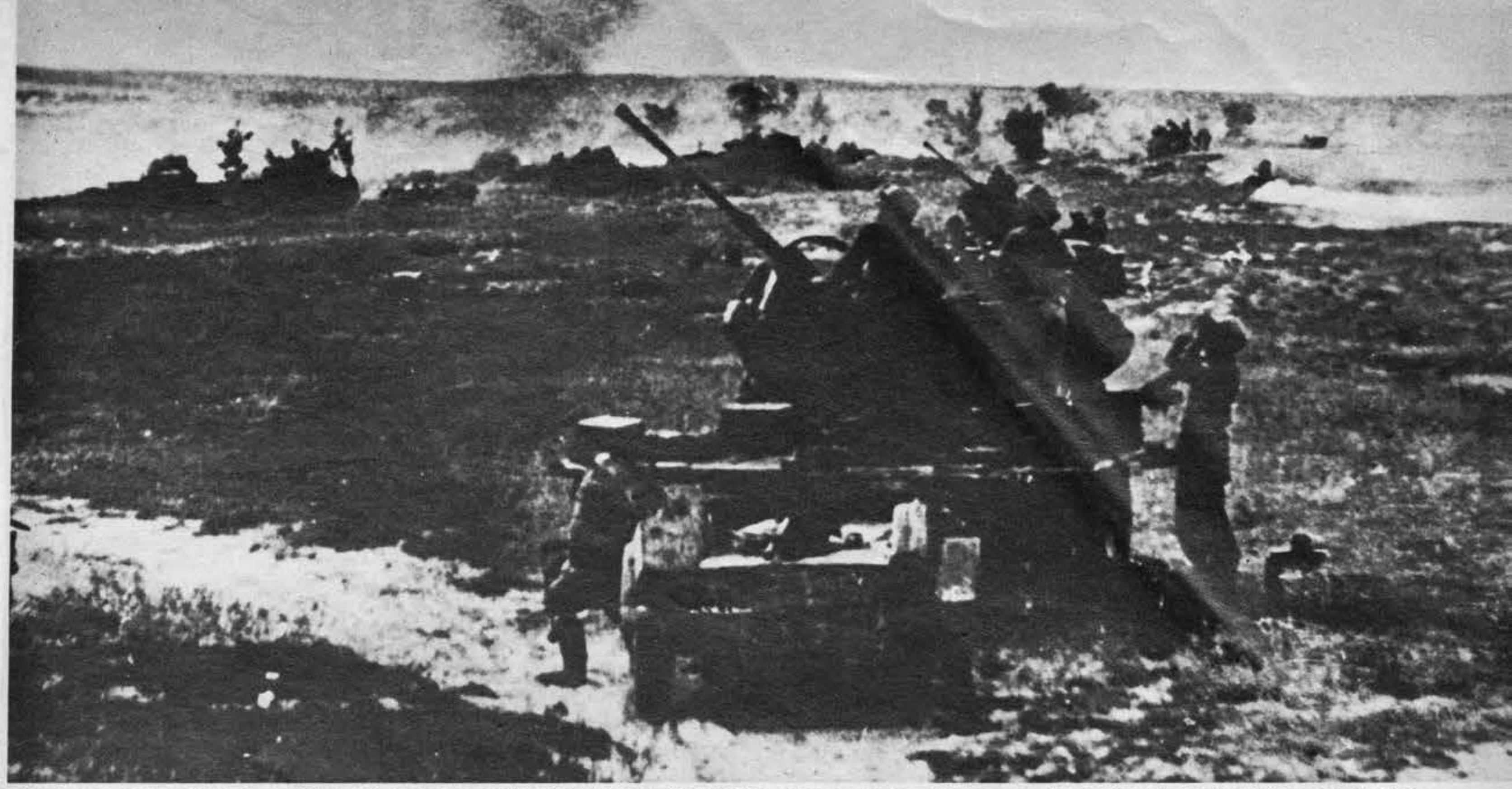

5

(For answers, see p. 50.)



LONG-BARRELED 37-MM. AA GUN IS POISED FOR GROUND ATTACK. THIS SELF-PROPELLED GUN ON A HALF-TRACK PERFORMS BOTH ANTIAIRCRAFT AND ANTITANK DUTIES



37-MM FLAK FIRES AT 45-DEGREE ELEVATION WHILE ITS CREW OF EIGHT SCANS THE SKIES. SINGLE-AXLE AMMUNITION TRAILER IS TOWED BY THE HALF-TRACK MOUNT

# GERMAN SELF-PROPELLED AA

## Flak on half-tracks can shoot it out with tanks

Antiaircraft artillery has become one of the most important weapons of this war. The vital defensive role it plays in shielding stationary targets from air attack is now being matched by the vigorous offensive warfare it wages in collaboration with ground forces. The Germans, who have always exploited offensive tactics to the utmost, were first to make antiaircraft artillery, or "Flak," self-propelled. They used self-propelled AAA to protect troops in bivouac or on the march, to cover assault forces, and even to work closely with their own reconnaissance and bomber planes in sweeps near the front. To each Panzer division the Nazis assigned at least one mixed battalion of heavy, medium and light AAA, the latter two types largely self-propelled.

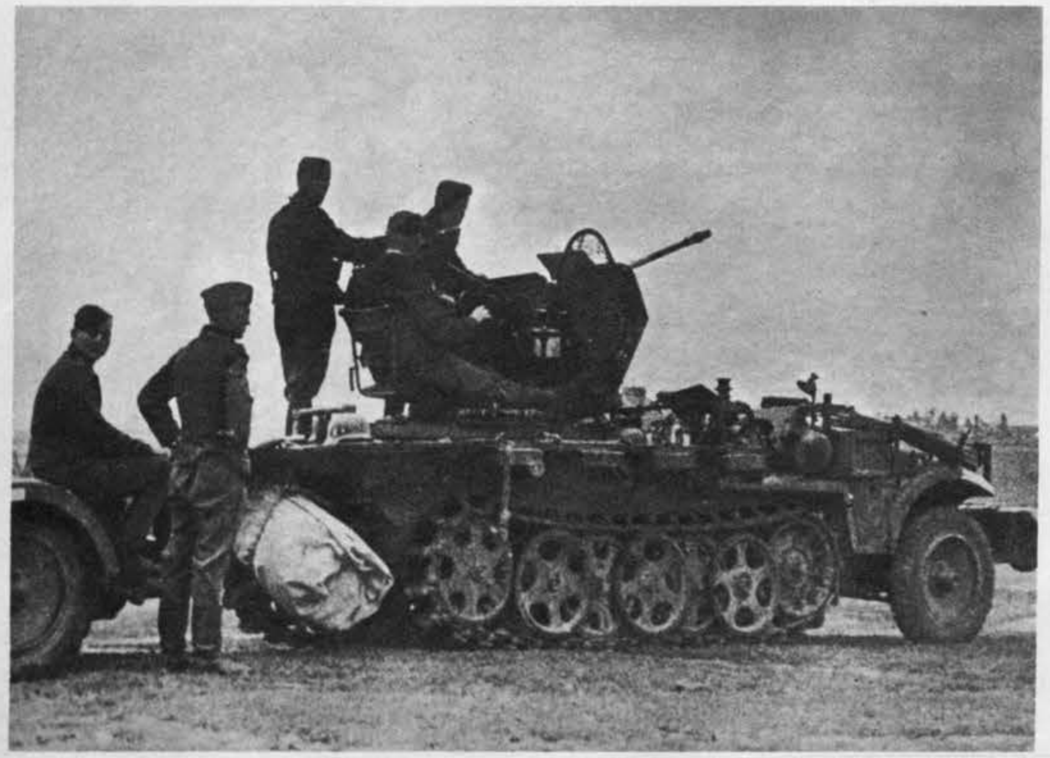
In the forward areas where Flak duties lay in seizing control of the air for ground units, they frequently came face to face with hostile tanks. Thus forced to undertake the dual role of AA/AT, most Nazi mobile Flak units, like U. S. AAA, carry both high-explosive ammunition for air attacks and armor-piercing shells for antitank fire. The three important Nazi self-propelled AA weapons are the single and quadruple 20-mm. and the 37-mm. guns shown on these pages. Heavier guns, like the 88-mm., when self-propelled are primarily antitank for lack of a carriage capable of withstanding both high elevation AA and horizontal AT fire.

The single 20-mm. Flak, a long, thin-barreled gun, is mounted on the familiar German half-track. The gun is usually situated directly behind the driver's seat and may or may not be shielded. It fires at a high rate, has a 360-degree traverse and is useful against low-flying planes and lightly-armored ground targets.

The quadruple 20-mm. Flakvierling is carried on an 8-ton half-track and is operated by a crew of about eight. The four guns, mounted coaxially in the center of the vehicle, can be fired together or in pairs so that some may be loaded while others are in action. Range and penetration of the quadruple 20 are much the same as for the single 20-mm. gun. Both types are primarily antiaircraft.

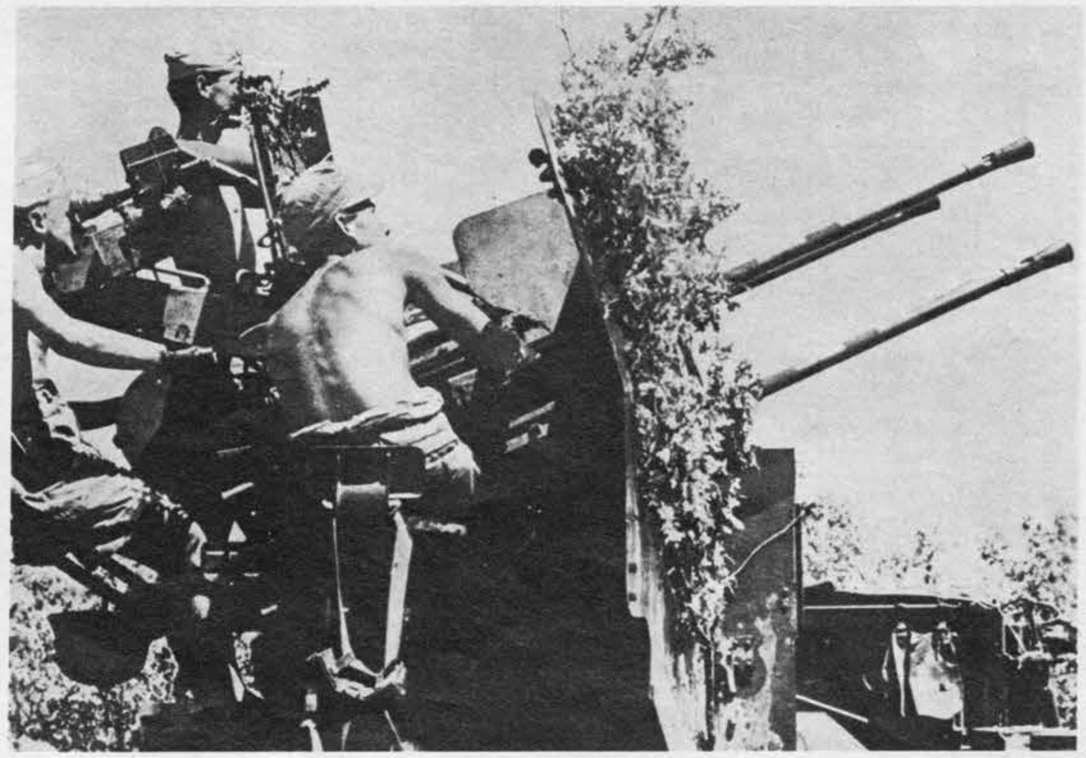
The 37-mm. AA gun on a 5-ton half-track is a more effective antitank weapon. Its long, slender barrel with conical muzzle brake is an important recognition clue. Its range of fire is effective against planes up to 2,000 yards and ground targets up to 1,000 yards. A small shield usually separates the gun mount from the driver's seat.

The half-track mounts for all three self-propelled guns belong to the same basic German design of which there are at least six different sizes. In each case the tonnage of these half-tracks is an expression of their towing power. All have a pair of truck-like wheels in front; a light track in back is supported by four or six overlapping bogie wheels. Speed of the average German half-track is about 30 m.p.h. As gun mounts they frequently tow ammunition trailers.

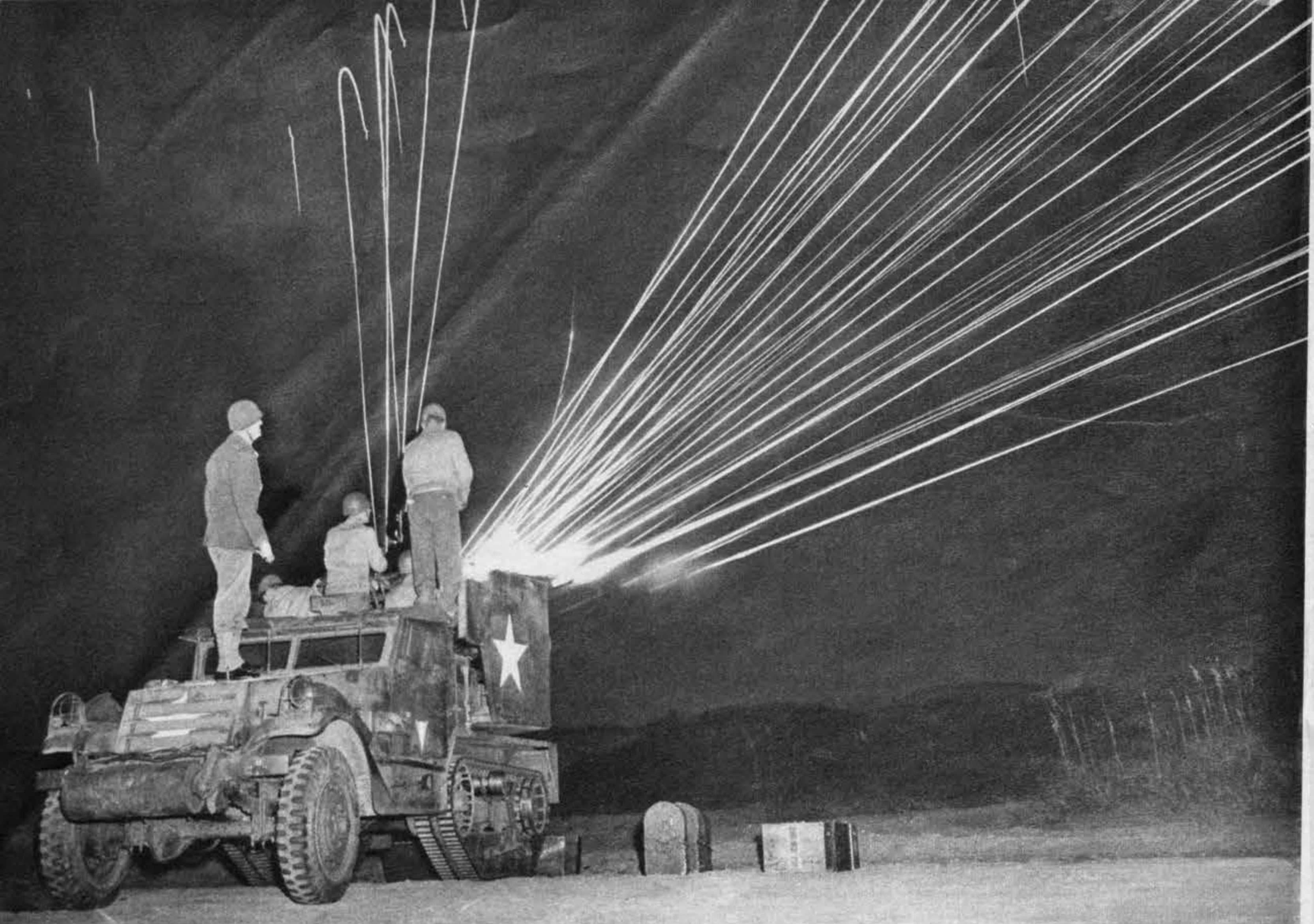


**WEARING LUFTWAFFE UNIFORM** Flak troops test 20-mm. gun mounted on a half-track. Sides of half-track have been let down to give gun freer traverse. The barrel is shorter, thinner than the 37-mm. above.

**SHRUBBERY BRANCHES** camouflage these quadruple 20-mm. Flak. Gun barrels point backward over ammunition trailers which their half-track mounts tow down a dusty road.



**NAZI GUN CREW** trains its four 20-mm. Flak against the skies. A newer weapon than single "20," shown on the opposite page, this gun with a slightly conical muzzle brake is being manufactured in quantity.



**TRACER BULLETS** in this target practice display colorful fireworks from twin caliber .50 machine guns and 37-mm. automatic gun of multiple gun motor carriage, M-15. Squad members act as antiaircraft lookouts. In combat they would fire from the protective concealment of brush or woodland.

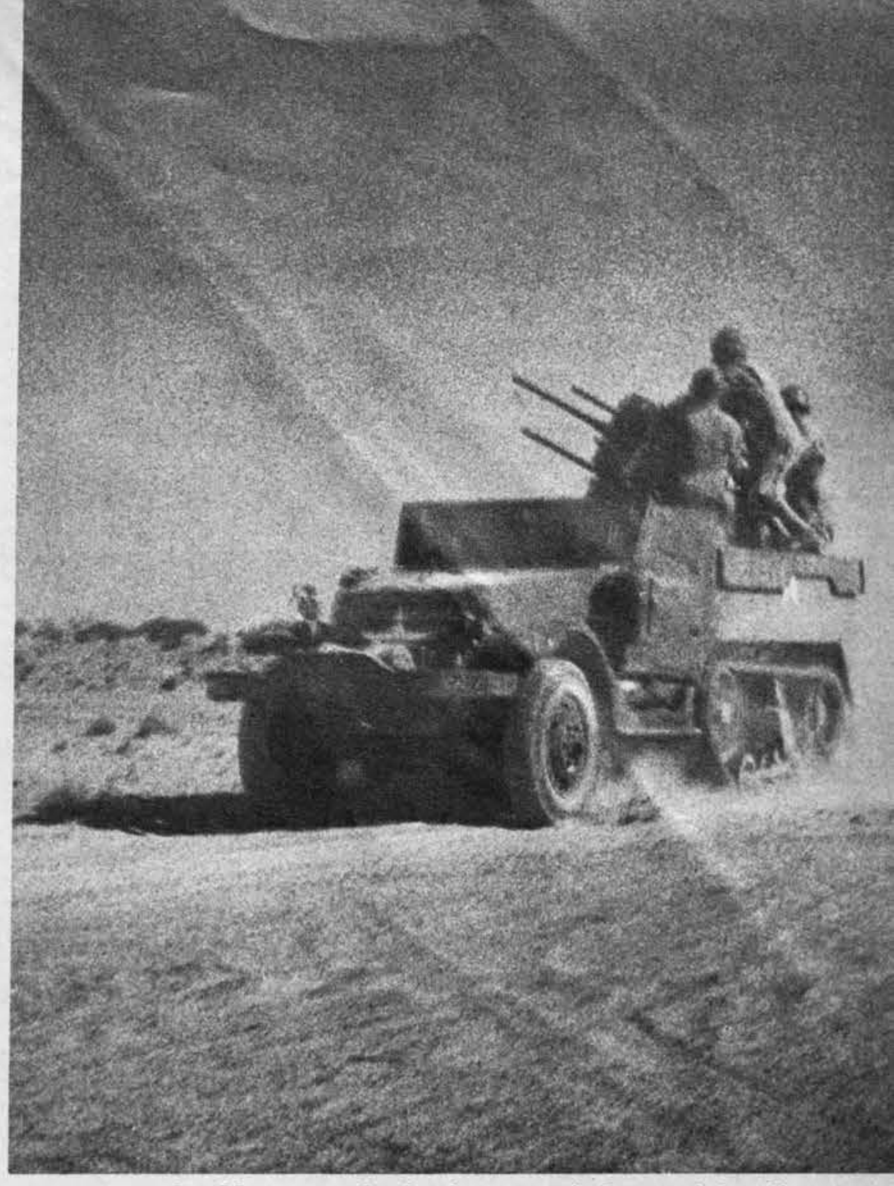
# U. S. ANTIAIRCRAFT ON MOTOR MOUNTS

Two U. S. self-propelled AA mounts won their first campaign ribbons in North Africa. The M-13 and M-15, fast-moving, fast-firing antiaircraft on half-tracks, threw up such a barrage of ack-ack against hostile planes that few dared attack when these guns were around. Since then, on all fronts, these guns have taken over the job of covering troops and vital objectives from overhead attack. On the beachheads of Sicily and Salerno, they raked the skies with antiaircraft fire, even brought down enemy planes from the decks of landing craft. Infantry and field artillery, too busy fighting ground battles to be able to defend themselves against strafing, bombing planes, counted on these weapons for protection.

Like their German counterparts (*pp. 8–9*) U. S. self-propelled antiaircraft guns are able to engage ground targets. The same high muzzle velocity and rapidity of fire which characterize antiaircraft artillery also make for good antitank weapons. Antiaircraft fire, however, is their prime job.

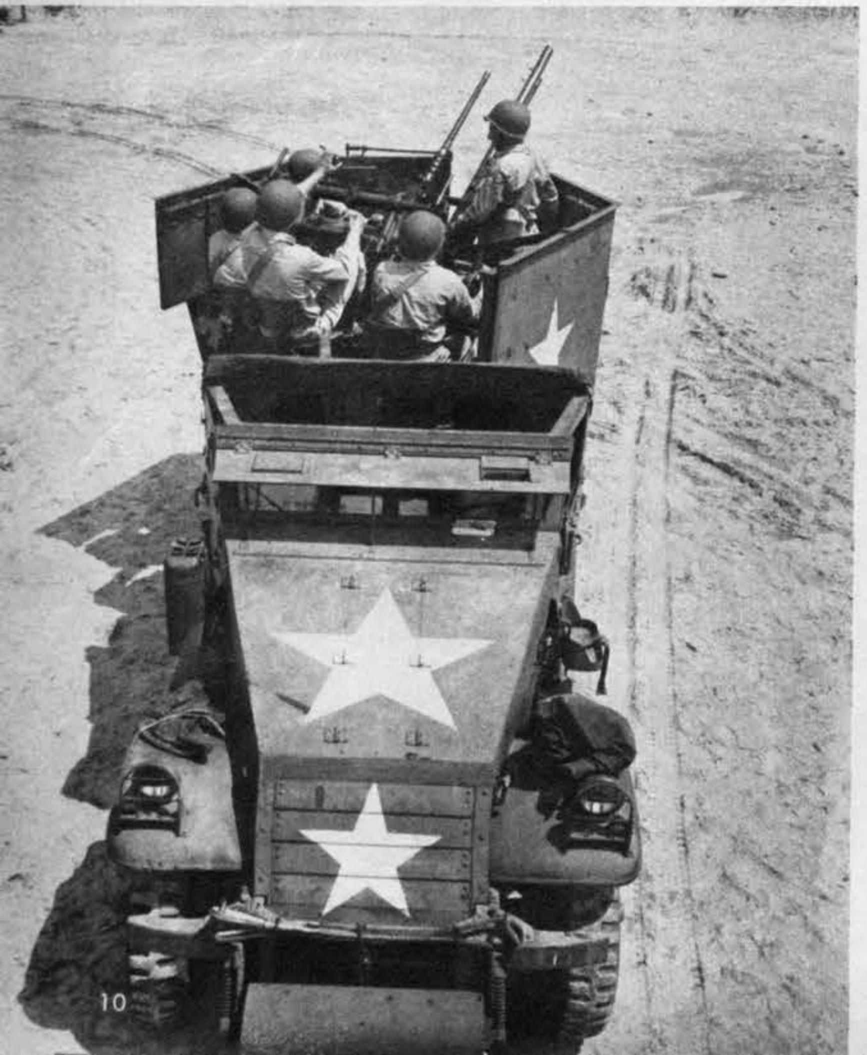
Earliest of the U. S. self-propelled AA weapons is the M-15, mounting twin caliber .50 machine guns plus an automatic 37-mm. gun on an M-3 half-track. Its guns are hand-driven. The M-13 is the first of the power-driven caliber .50 turrets mounted on half-tracks. It mounts twin caliber .50 machine guns and operates like an airplane ball turret. The M-16, a newer antiaircraft weapon, has four caliber .50 machine guns on the same half-track mount. All three of these guns send out tracer bullets which help direct the fire onto the target.

The M-3 half-track which mounts these guns is a well-known U. S. chassis. Hinged on the top of its rectangular sides are strips of armor which may be folded down for freer gun traverse.

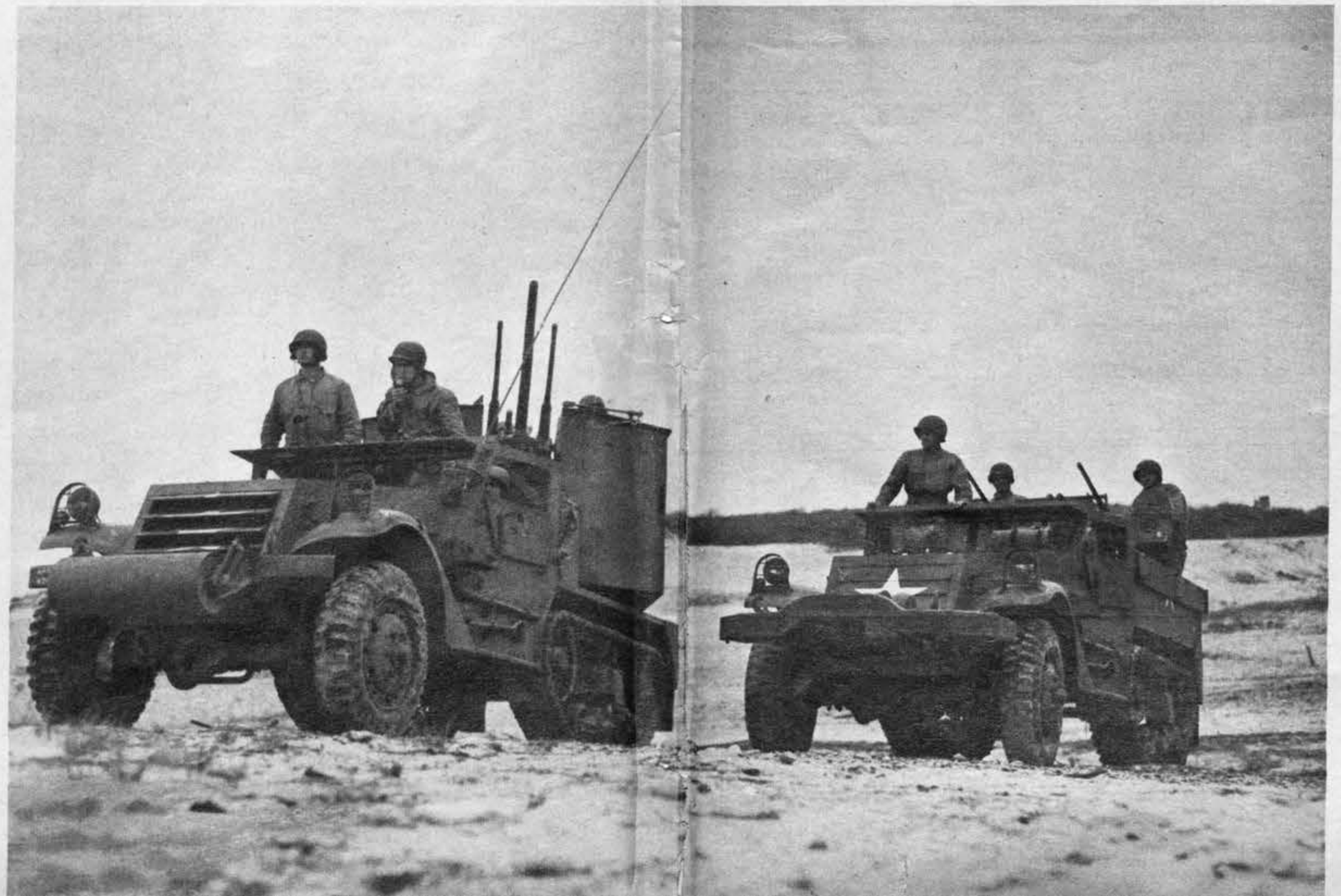


**THE GUN CREW** of an M-16 are on the alert for enemy airplanes as their vehicle crosses the desert. The four .50 calibers of the M-16 fire simultaneously.

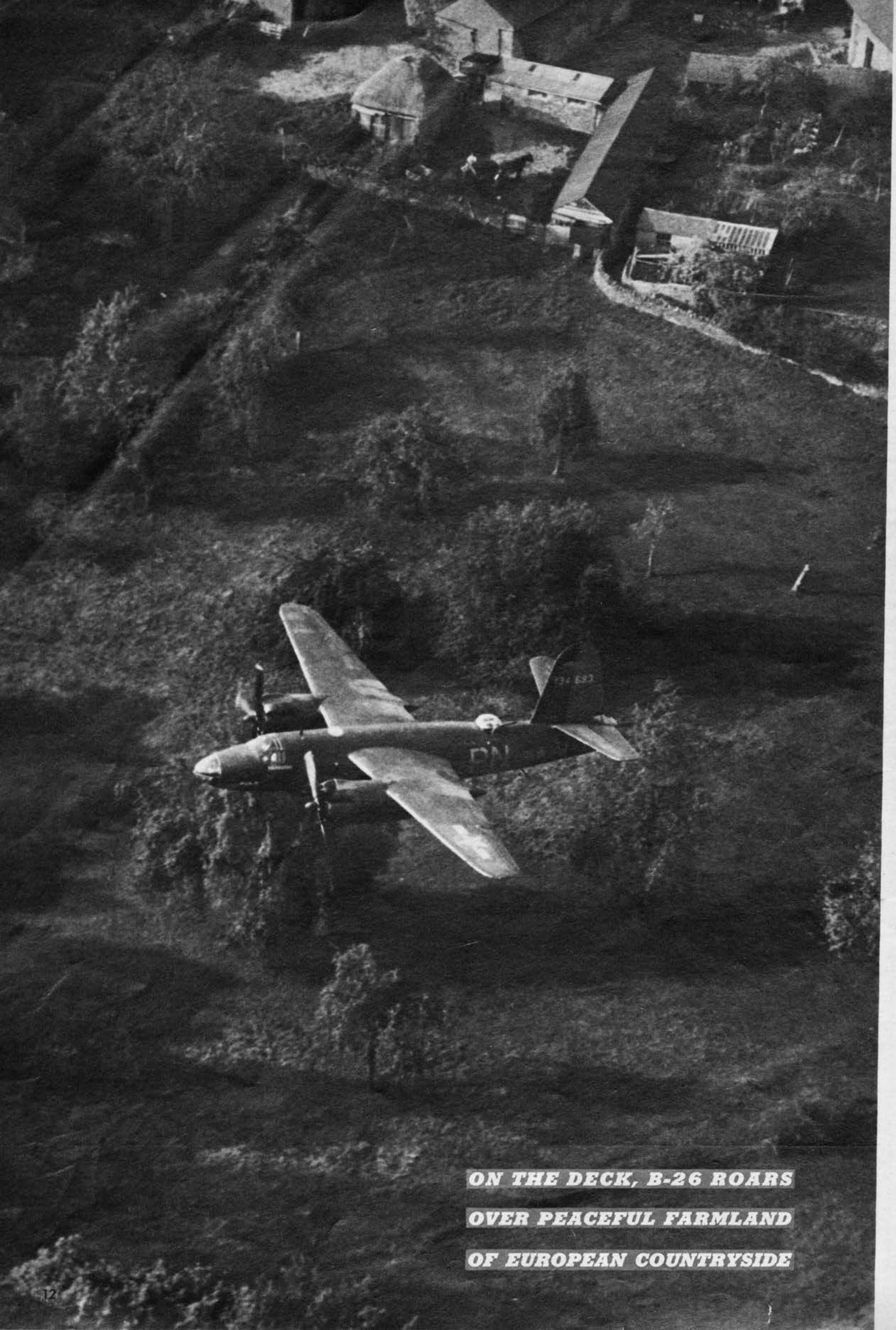
**DOWNWARD VIEW OF M-15** shows the armor on hood and driver's cab. An open-topped shield or "bucket" revolves with guns, is cut out at the back.



**M-15 (LEFT) AND M-13 (RIGHT)** travel easily over rough ground. Guns will fire while half-track is on the move. The M-13 has no genuine gunshield for its power-driven turret of twin "50's," only vertical sides of the half-track hull. The M-15 has a tall "bucket" shield and extra 37-mm. gun.



**ON THE MOVE** four .50-caliber machine guns on the M-16 multiple gun motor carriage point backwards over ammunition box of their half-track mount.



ON THE DECK, B-26 ROARS
OVER PEACEFUL FARMLAND
OF EUROPEAN COUNTRYSIDE

TWO A-20'S IN SKIP-BOMBING PRACTICE JINK AWAY AFTER RELEASING BOMBS AS IF EVADING GROUND FIRE FROM DEFENDERS' MACHINE GUNS

# GROUND WORK

## THESE ARE THE PLANES THE GROUND MEN SEE

Most important airplane to the man on the ground is the one with a direct effect on his life: the enemy diving in to attack him, friendly craft roaring overhead to strike the German or Jap in the facing lines. Great waves of long-range bombers may move across the sky as they wing towards strategic objectives in the rear. High-altitude fighters may wheel about in lonely duels in the sky. But these are not the ground fighter's business; if they are friendly, he can do nothing to help them, if enemy, they are out of his reach.

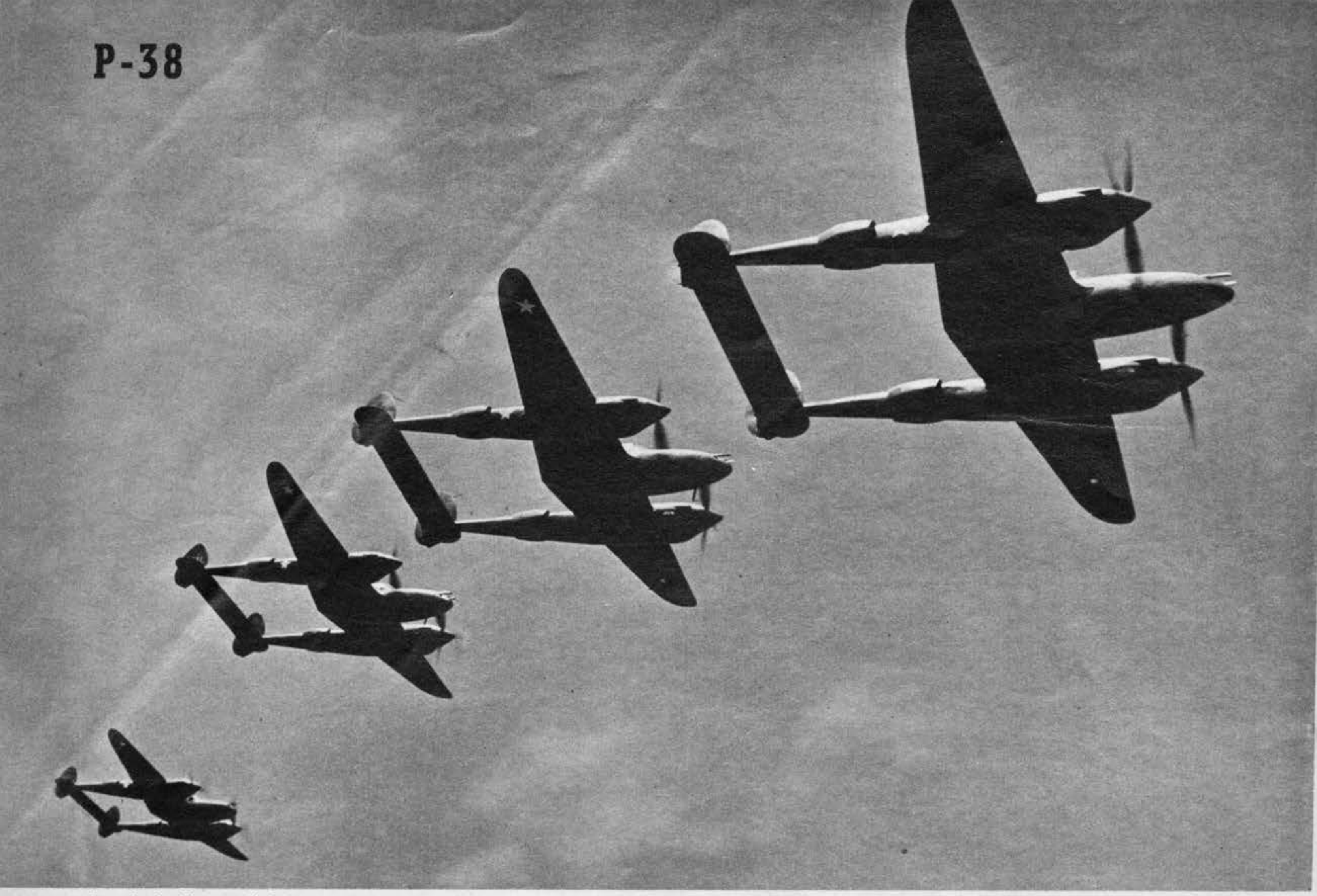
But there are many planes ground troops will see and must recognize immediately. These are the planes of the tactical air forces. They include fighters and fighter-bombers which strafe and bomb front-line troops; low-flying medium and attack bombers dropping skip- or parabombs; divebombers, and cargo planes with loads of parachute troops and supplies. Most of these will fly within 500 ft. of the ground, well within the range of small-arms and machine-gun fire.

In any new offensive, a tactical air force will operate in three distinct phases. First it will try to knock out opposing airpower. Attack and medium bombers will try to catch enemy planes on the ground and destroy them *en masse.* Fighters and fighter-bombers will harry defensive fighters from the air. Bombers of all sorts—heavy, medium, light—will pound enemy airdromes, destroying landing strips, repair sheds and personnel quarters.

As the defensive air force weakens, the tactical arm will turn its attention to enemy supply lines and concentrations. All roads leading to battle areas will be strafed and bombed. Supply and ammunition depots will be smashed. Concentrations of enemy force will be blasted before they can disperse into action. The battlefield will be isolated until all enemy force is expended and its resistance broken.

While the battle rages, fast attack, and bombing craft will be used directly against the enemy's fighting troops. As advancing forces run into strong points, they will call up airpower to overreach the fortifications or to blow the obstacle from the infantry's way. Fighter-bombers will weave over the battlefield, hitting targets of opportunity. Close co-operation and communication between land and air forces will mold them into a single great weapon.

On the following pages are presented the Allied and enemy airplanes now engaged in this sort of fighting; the ones men on the ground should get to know. All of the principal types are included. It is probable that no one man will see all of these, and it is equally probable that some men will see planes not included here. But at present writing, these are the important low-flying land planes of the theaters in which American troops are active.



**America's biggest fighter,** the Lockheed P-38 has three important low-altitude jobs. The five guns in its nose make it a great strafer at long and short ranges. Its bomb load of two 1,000-lb. missiles is effective against large and small targets. In photo-reconnaissance versions it often sweeps close to the ground for low-altitude oblique shots. In any of these activities Allied ground personnel may see it, must recognize it and hold their fire.

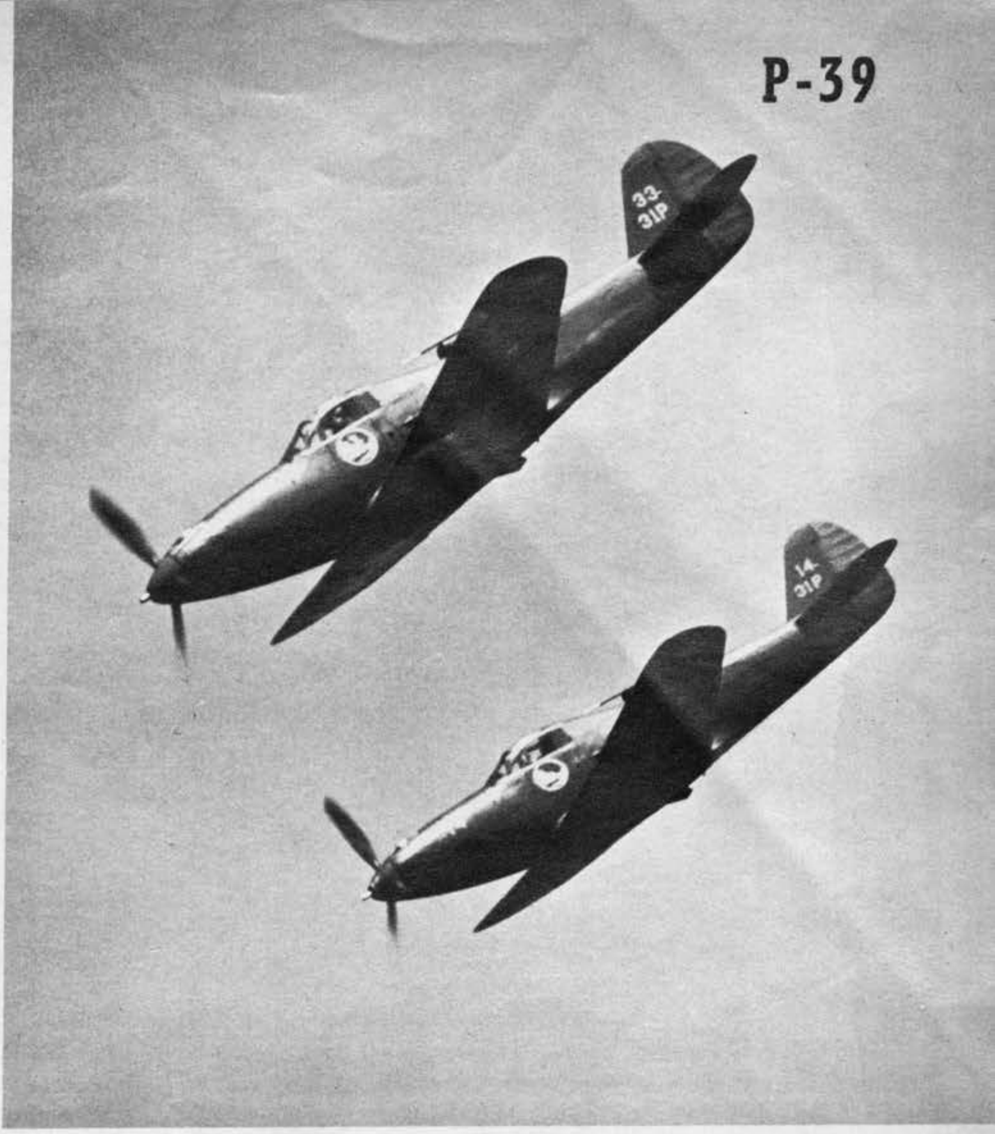
**In North Africa,** the Lightning saw its first use as a ground attack plane, strafing airfields, bombing supply transport, and shooting up the Nazi armored forces. At the assault on Pantelleria, P-38's skip-bombed cave hangars to knock out Italian defensive planes. The most distinctive plane in the USAAF, Lightning is easily spotted by twin booms, long nose and wedge-shaped wing plan. In off-angle views, the plane has a welter of projections.

# WE LEARNED IN N. AFRICA

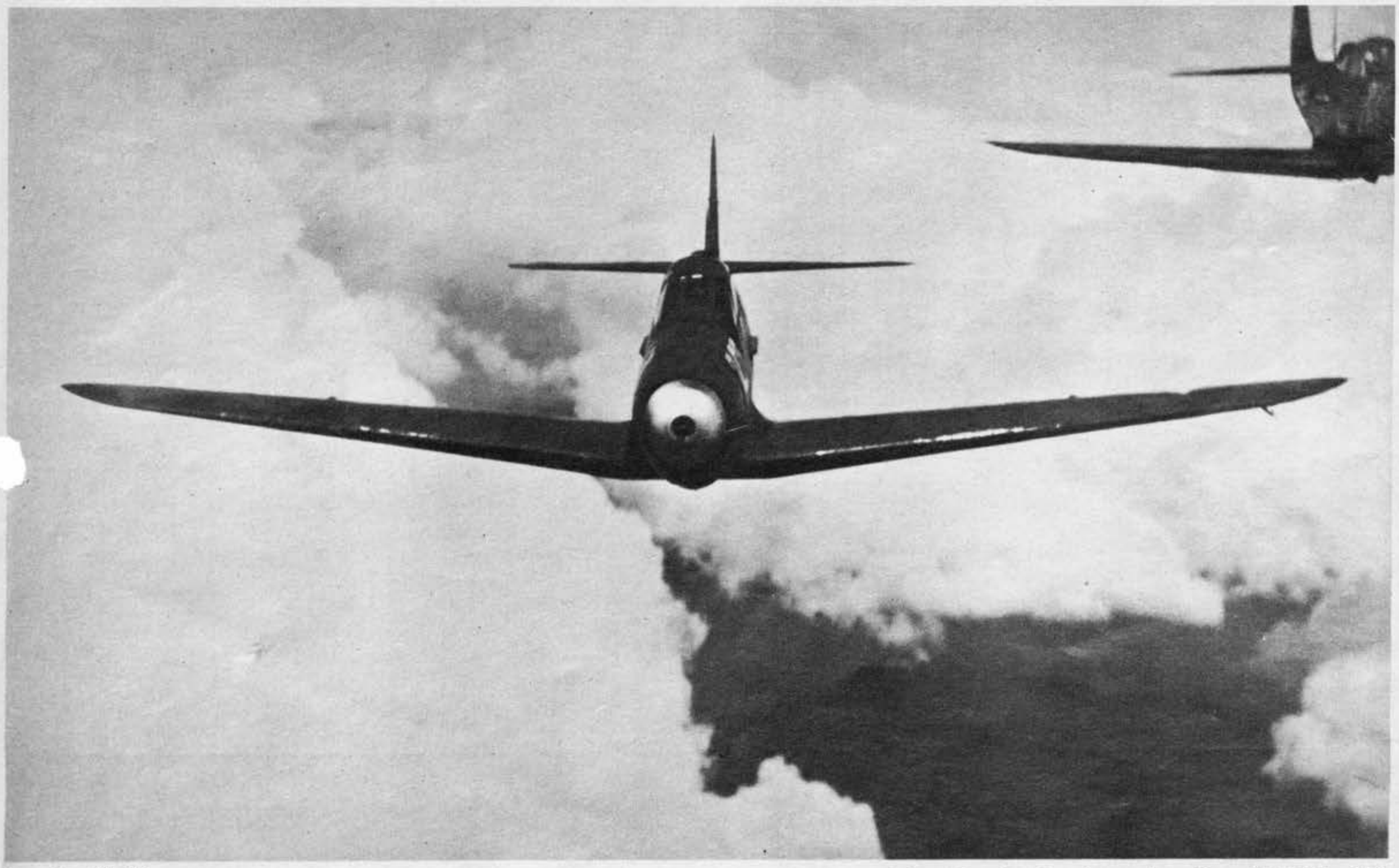
Though the pre-war Army Air Corps had practiced tactical maneuvers throughout the 1930's, our battle ideas got their first real workout in North Africa. In the most fluid battle area of the war, steady bombing of specific objectives was seldom possible. Where the enemy was one day was not necessarily where he would be on following days. Thorough reconnaissance and continuous communication became first requirements. Moreover, the greatest possible flexibility was called for in all aircraft. Fighters became bombers, dropped their loads, then fought off interceptors. Fast medium bombers learned to strafe with their forward firing guns before dropping their bombs. Massed air strength struck at limited objectives through a dispersed enemy air force.

First plane to be adapted to desert warfare was the durable P-40 (*see next page*). Because of its ability to absorb flak and the close grouping of its wing guns, the P-40 was an excellent strafing plane, while its high speed dive pull-out made it a practical divebomber. The P-38 interceptor proved it could do a great variety of jobs and was soon one of the most active types in the area. The great new P-51 acquired dive brakes and became the A-36, fastest attack plane of them all. On other fronts, particularly the Russian, the Airacobra's cannon was proving a potent anti-armor weapon. Everywhere the B-25's, B-26's and A-20's unloaded their heavier bomb loads on Nazi and Fascist concentrations.

P-39

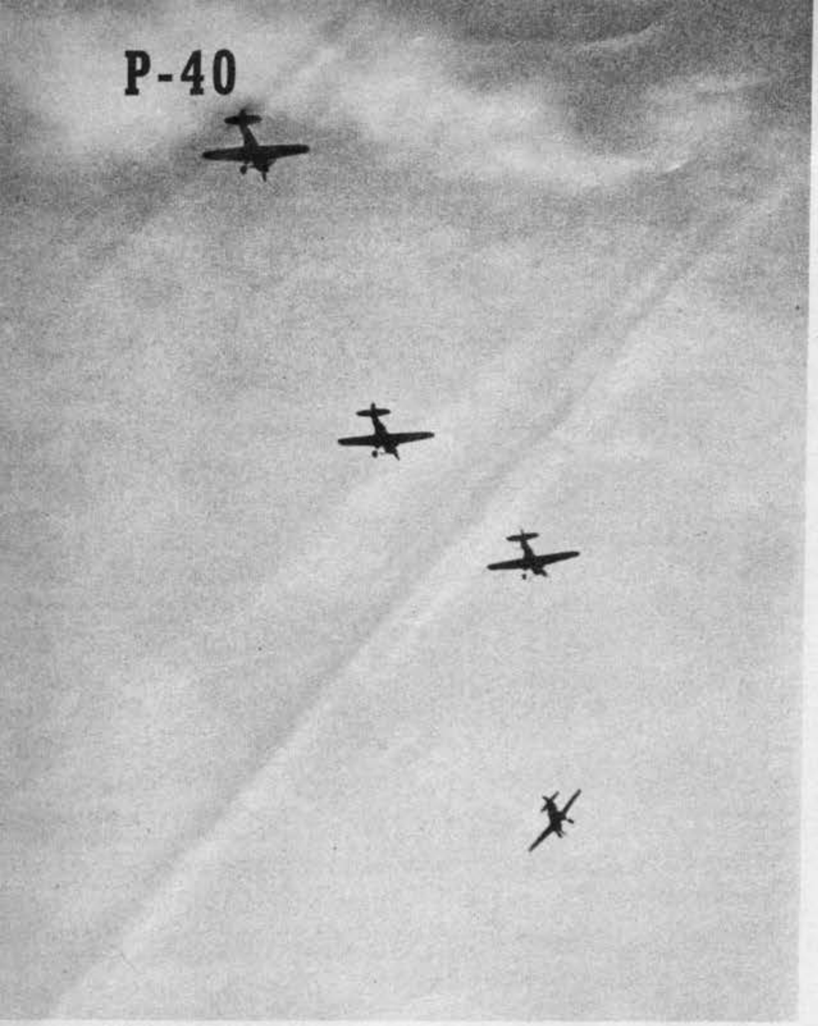


**Diving to attack,** an element of two P-39's bring their guns to bear on enemy positions. Like all fighter planes, the P-39's guns are fixed to fire forward. Therefore, in order to strafe it is necessary to dive the plane, pointing its nose at the ground target.

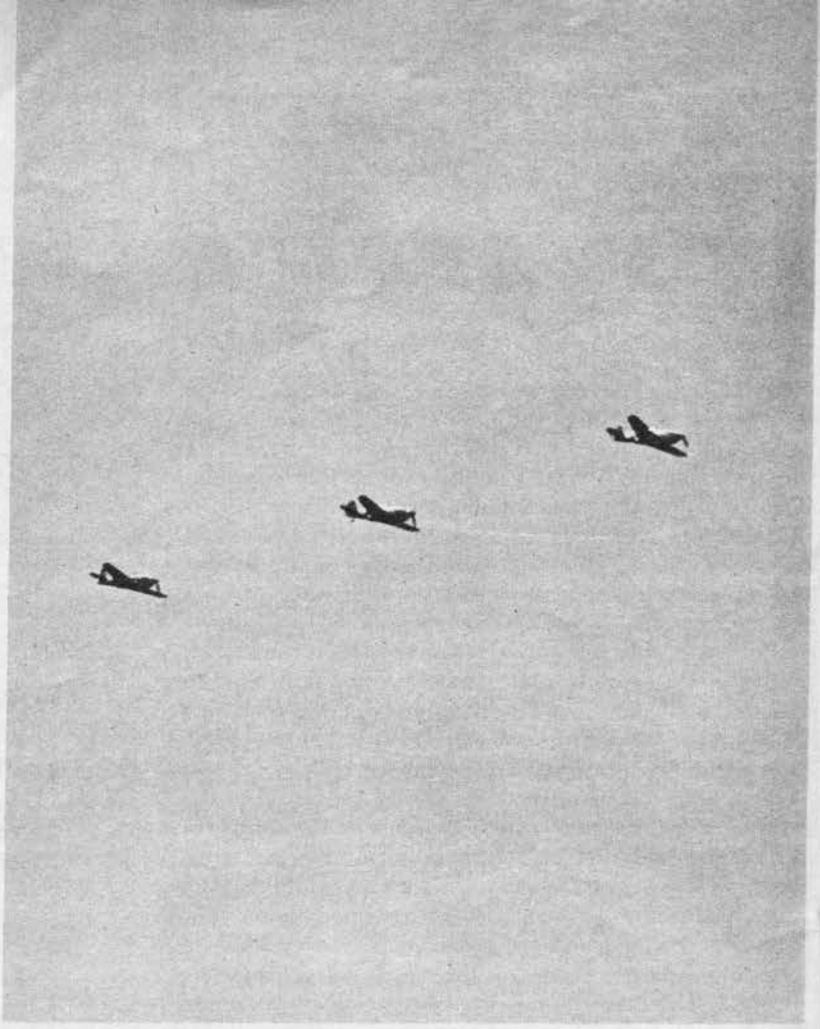


**Armed with 37-mm. cannon,** P-39 was one of the first fighters specifically designed for ground attack. Its big gun can pierce light armor, while its own belly armor gives it protection from ground fire. Mounting the engine behind the cockpit makes the plane less vulnerable to light flak which might cause mechanical failure. The Airacobra's pointed nose and upswept tail are distinctive, making it appear to sit in the air like a rocking chair.

# P-40

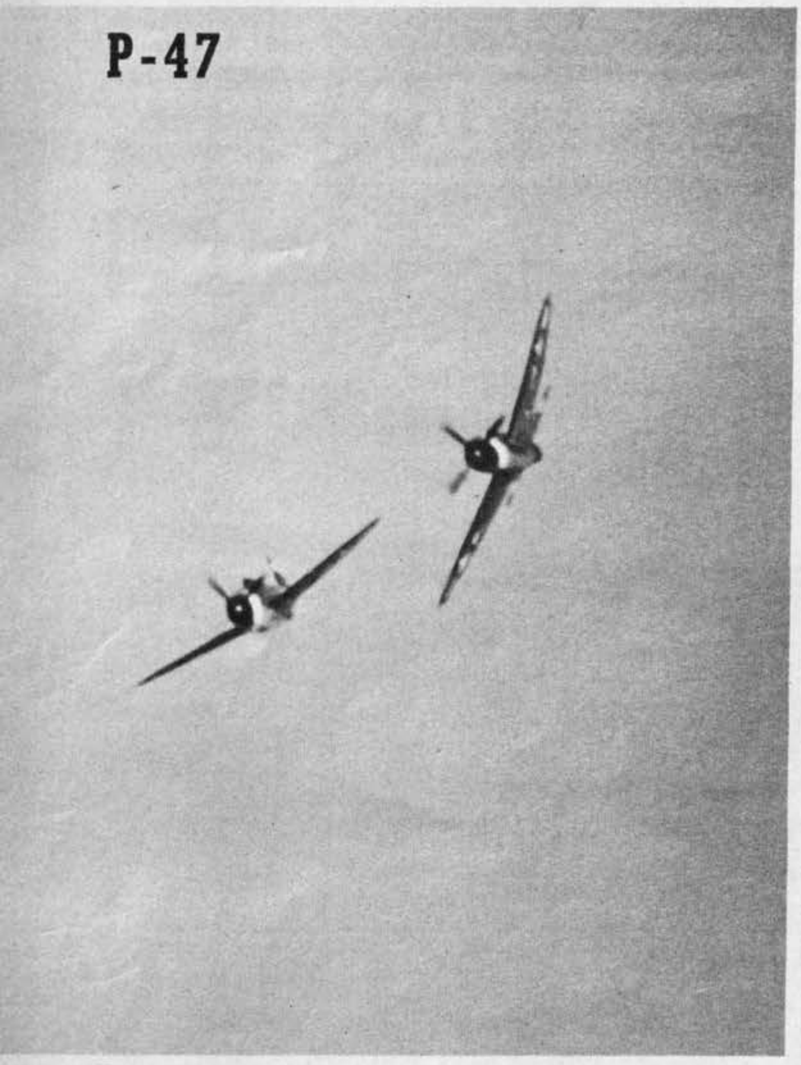


**Flight of P-40's** peels off and heads for the ground. The only American fighter available in quantity when war came, the P-40 went into service immediately on all fronts to perform every job in the book.

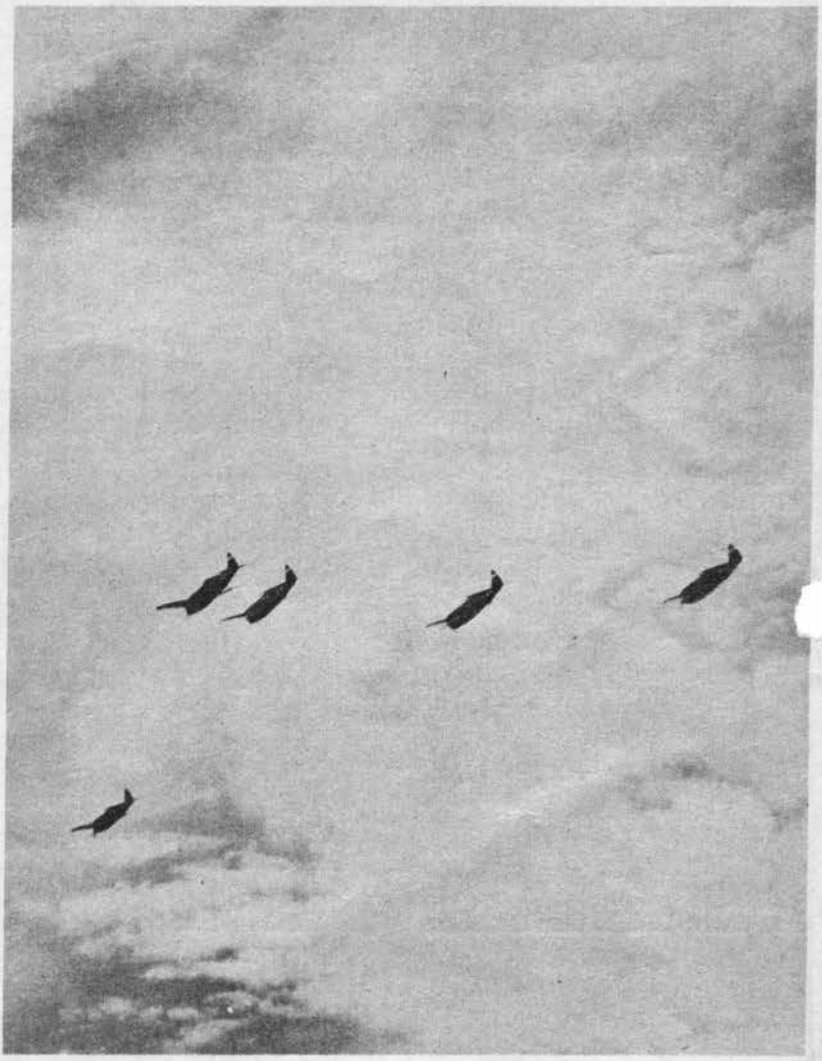


**Until late in 1942,** the P-40 was the best desert and jungle fighter the Allies had. Since then P-40 has done a yeoman's job operating as an attack bomber, the Kittibomber, toting a 500-lb. general purpose bomb on racks under each wing.

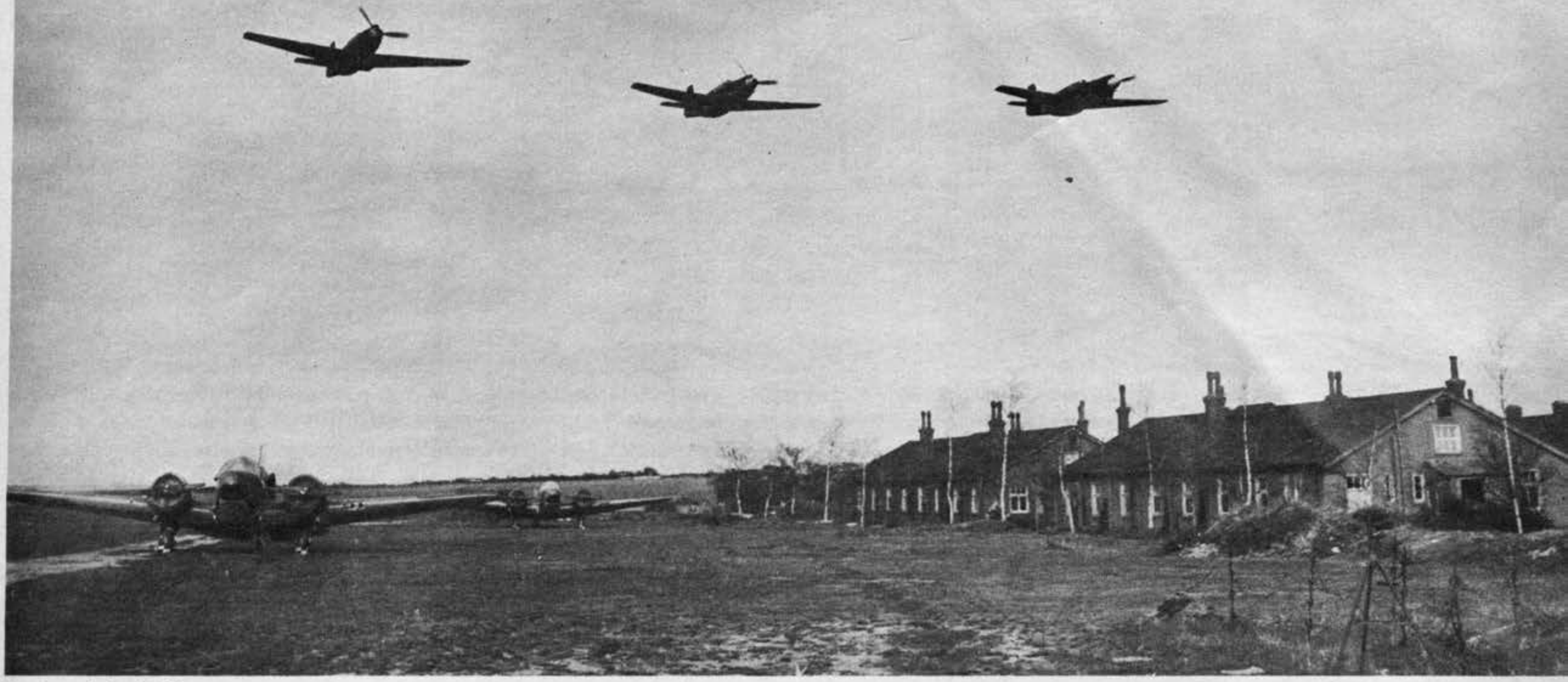
# P-47



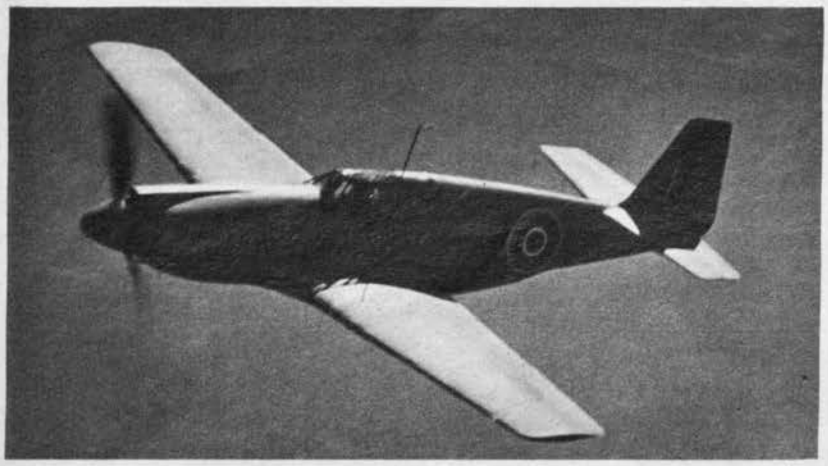
**Most recent convert** to fighter-bomber use is USAAF's crack high-altitude fighter, the P-47 Thunderbolt. In its new use it has seen action in Europe, recently bombing Nazi airdromes in The Netherlands.



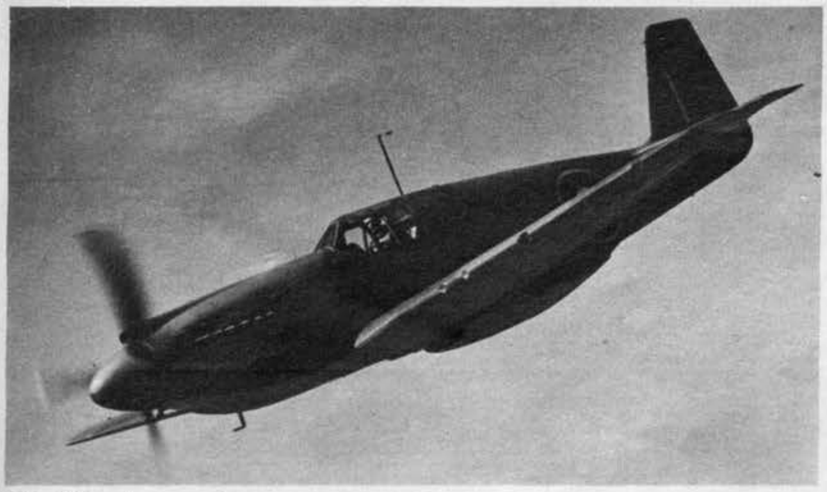
**As fighter-bomber,** the Thunderbolt carries three 40-lb. bombs under each wing and one 500-lb. bomb under the fuselage. Because of its flight characteristics, the Thunderbolt will dive at its objectives rather than approach at low levels.



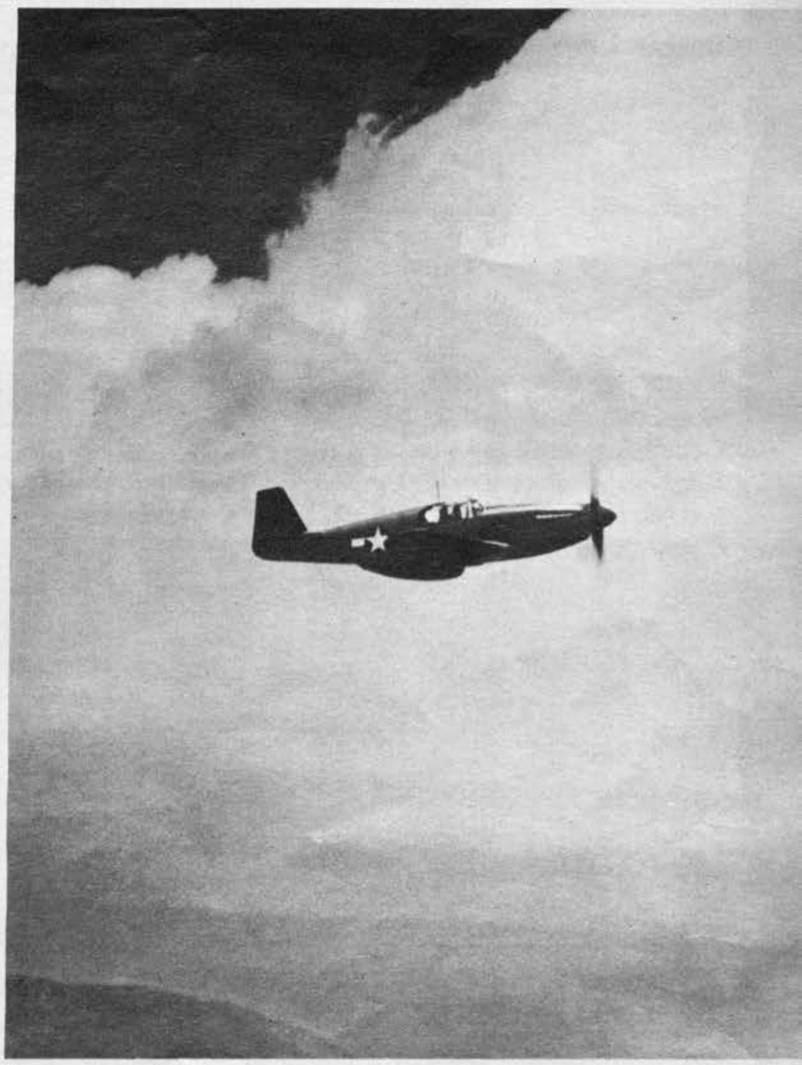
**Designed for RAF,** the P-51 Mustang saw its first duty as part of the Army Co-operation Command as a replacement for the slow parasol-wing Lysander. In this service it gained great fame as a locomotive buster, effectively disrupting supply lines within reach of its bases in England, before coming into use as a fighter at medium and high altitudes. On the ground are two Airspeed Oxfords which are used for cargo and twin-engine training.



**Effectiveness on the deck** is made possible by the P-51's laminar-flow wing and square wingtips. The thin leading edge slices through the heavy ground-level air, while the blunt wings make the airplane easier to roll about in evasive action.

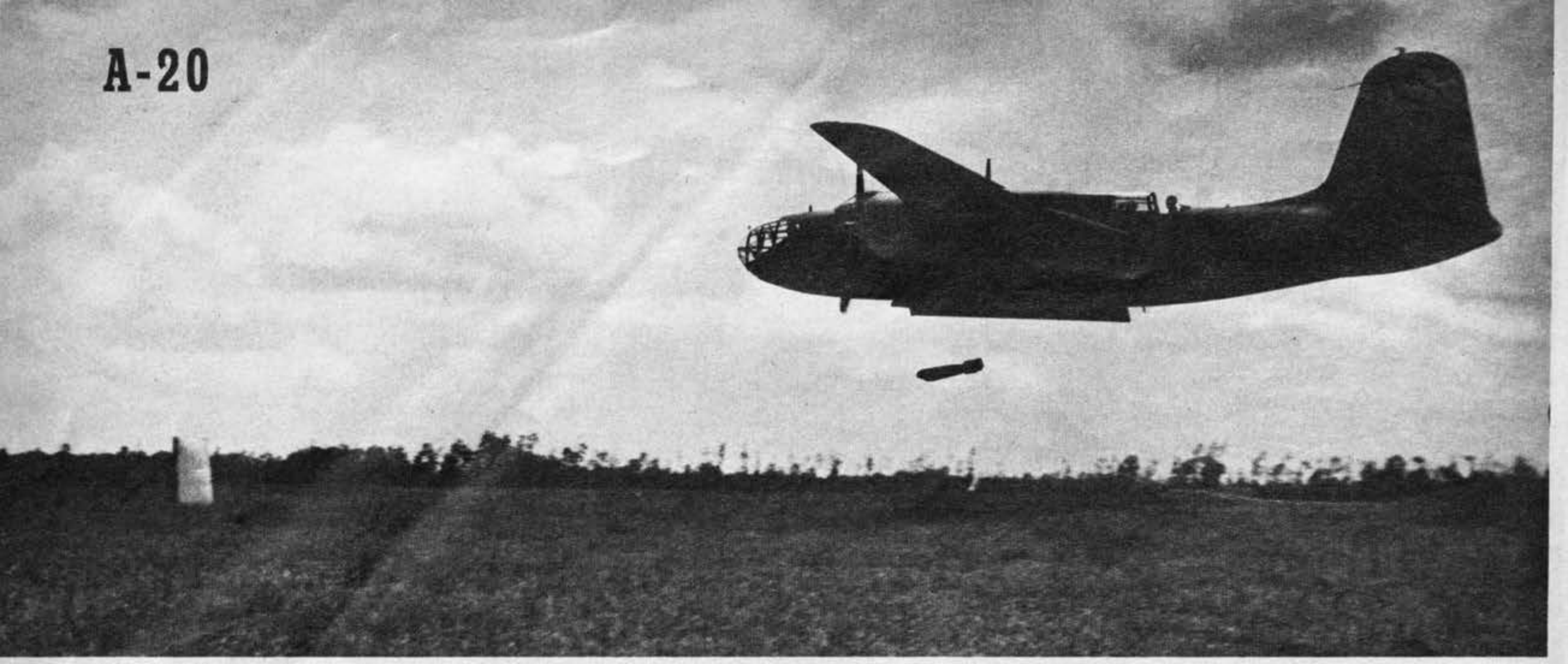


**Attack bomber version** is called the A-36 or Invader. It has a high diving speed, with or without the use of its grill-type brakes, but is chiefly used in rather shallow dives for close support work. It operates as a fighter after dropping bombs.



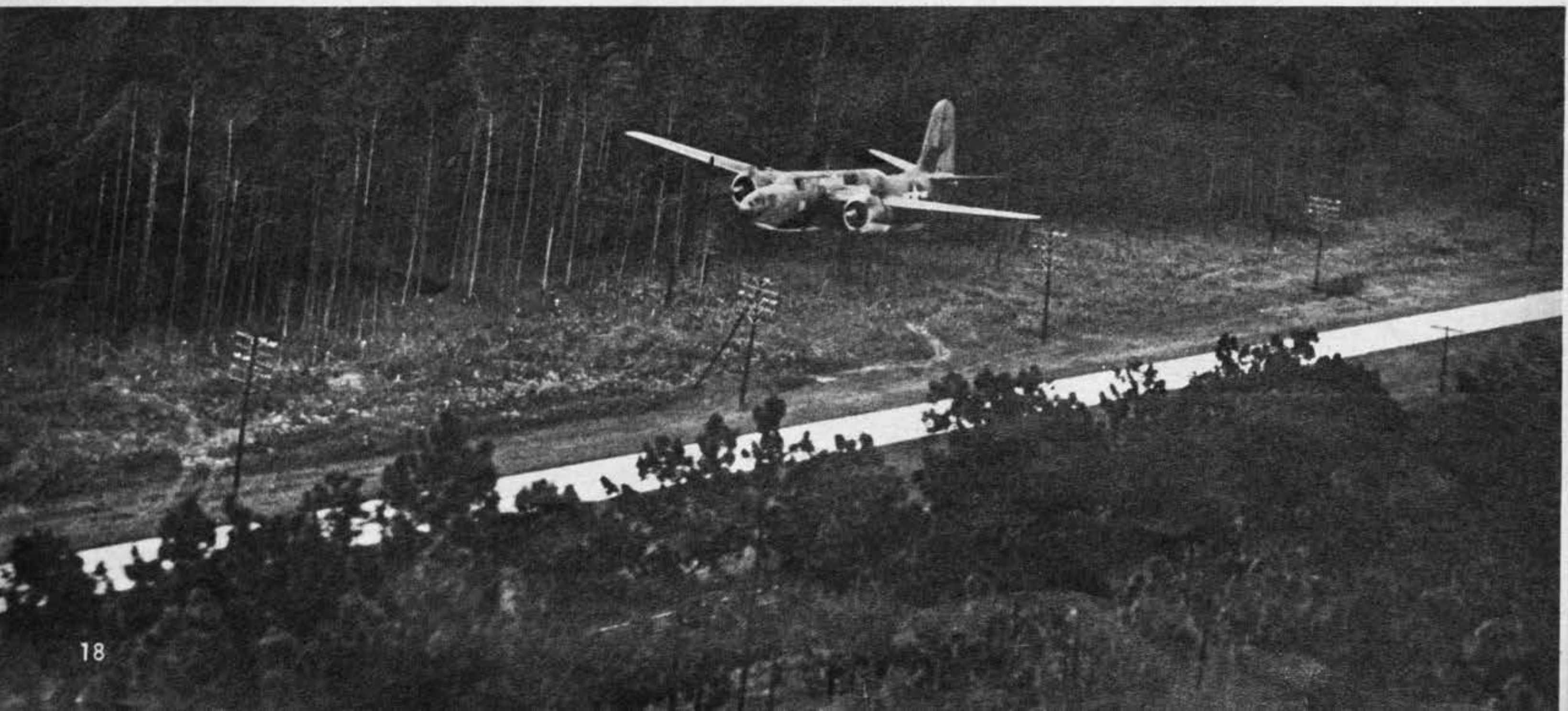
**Square-cut wings** and tail surfaces and bulky airscoop beneath the fuselage are the chief recognition details of the Mustang. From the ground, the squareness of its outlines are particularly striking.

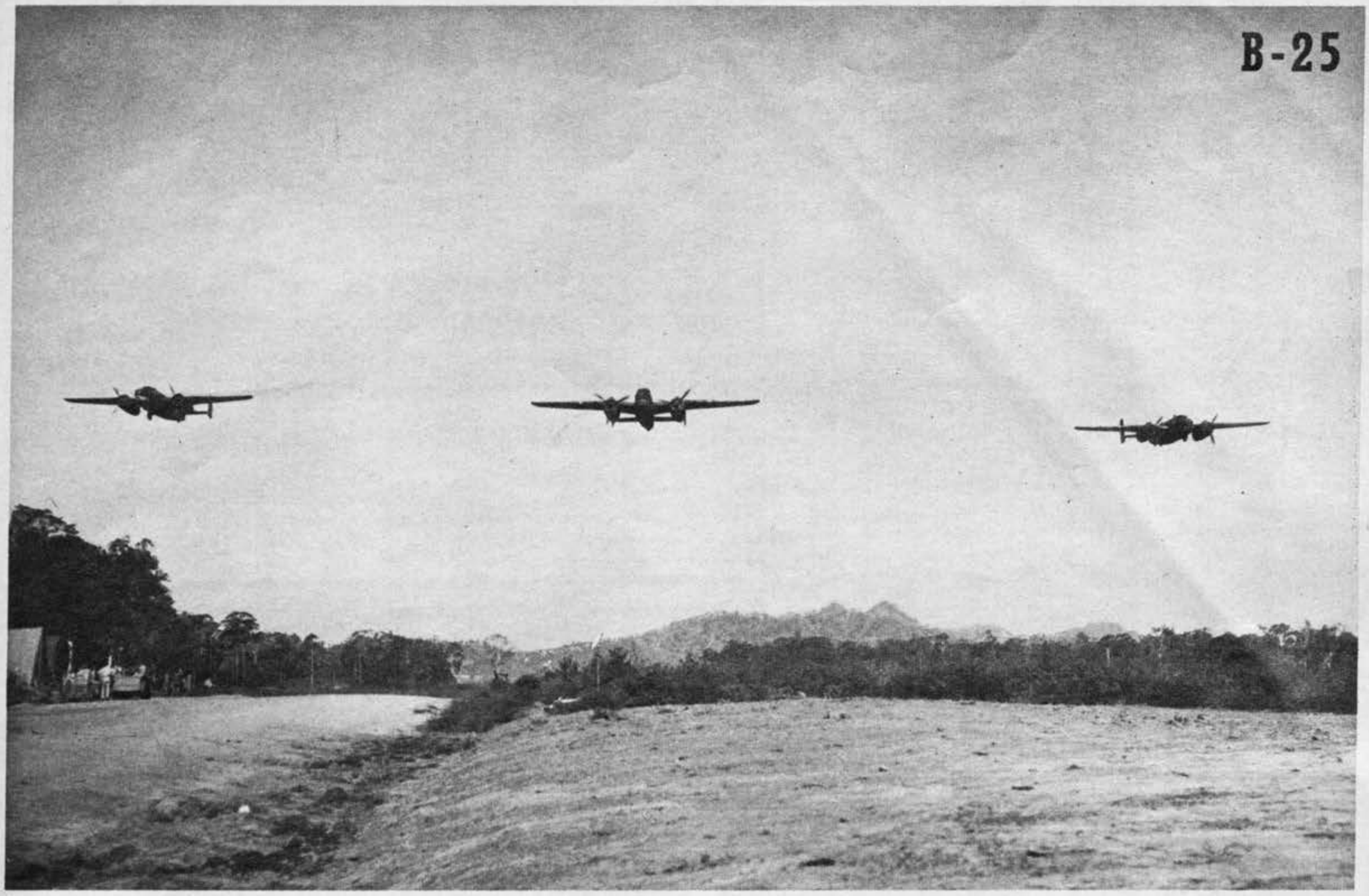
# A-20



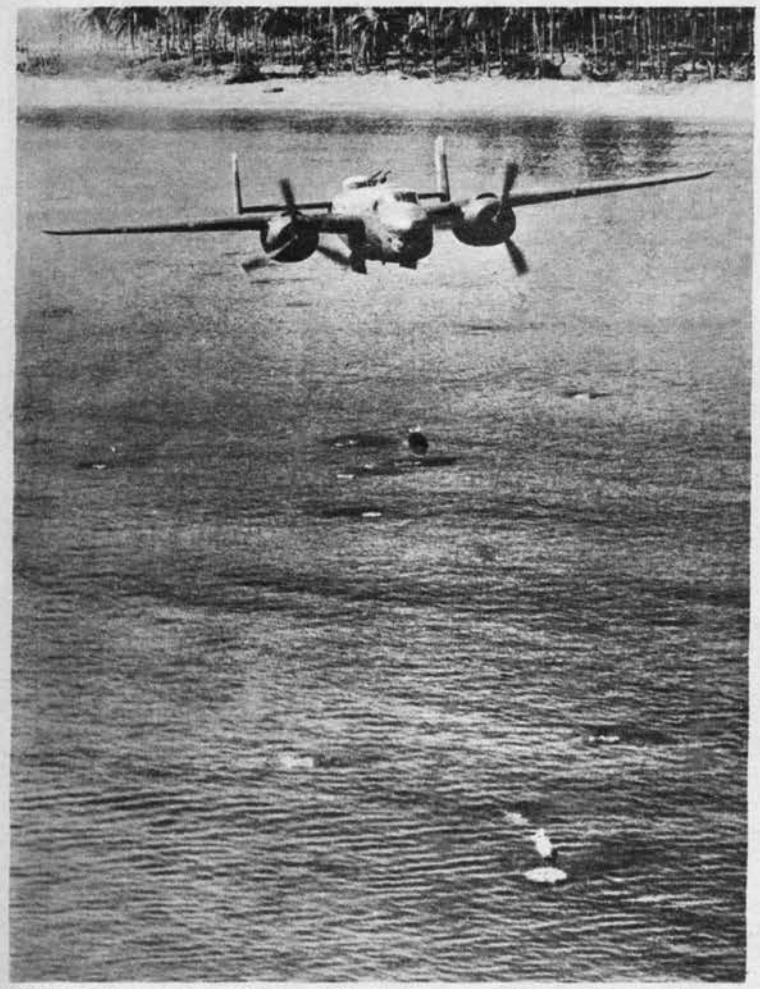
**Skip-bombing** is latest low-level attack technique. Best plane for the job is either the A-20 (*on this page*) or the B-25 (*opposite*). The B-25 has the advantages of better visibility and greater bomb load; the A-20 has more speed. Both airplanes have smooth maneuverability for dangerous close-to-ground flying. Skip-bombers make their drop from altitudes of 50 to 200 ft. using delayed fuse bombs to allow time for attacker to jink away.

**Coming at target** the A-20 shows two fat nacelles close to the fuselage and marked dihedral on the high midwing. The plane needs a steady run of only five seconds before bombing, weaves about before and after loosing its bombs. Below, an A-20 makes a practice run up a highway. In war zones, low-level craft will strafe and bomb all lines of supply, usually in pairs, one to blast trucks on road, one to strafe personnel in the ditches.





**Greatest name** in low-level bombing is the B-25 Mitchell. In this picture three are returning to a Southwest Pacific base after having sunk two Jap ships. The B-25 has been used for skip-bombing land and sea targets; it has parachute-bombed Jap airbases as well as operating as a medium altitude precision bomber. For heavy duty, its forward firepower has been increased in the B-25G by the addition of a 75-mm. cannon in the nose.

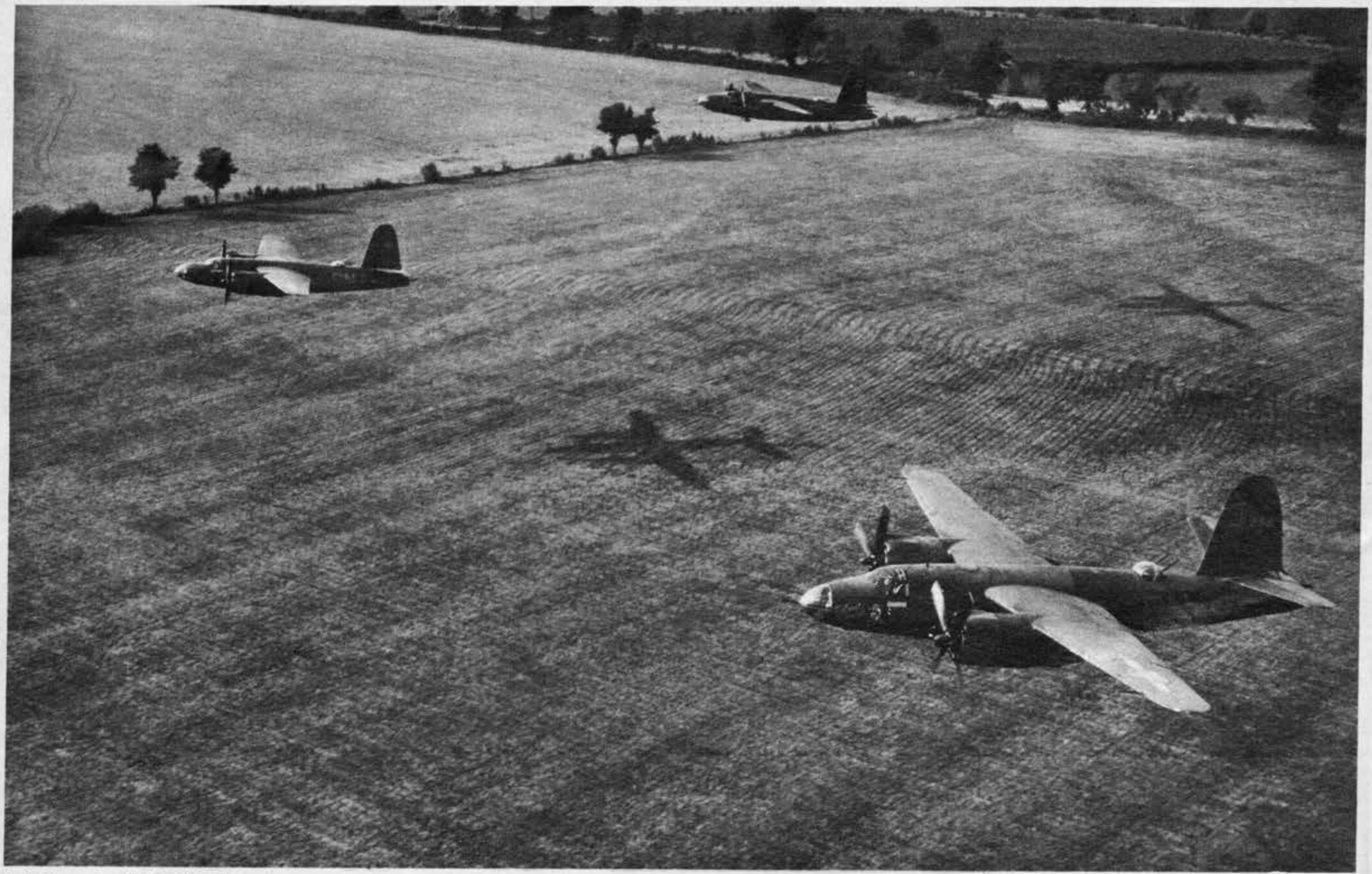


**At Wewak,** on New Guinea, a Mitchell zooms in low to skip-bomb 500-pounders at Jap ships in the harbor. The first bomb should bounce at hull, second one strike the deck in free fall as the plane whips over mast-high.

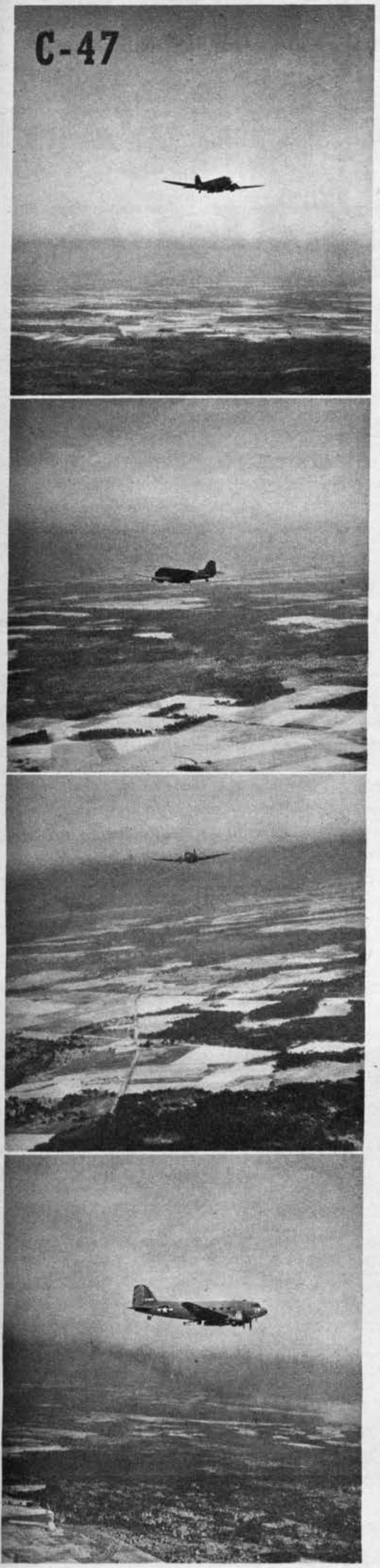
**B-25's buzz** airstrip at Wewak. In this attack parabombs were the chief weapon against personnel and string of Jap planes shown camouflaged beside the strip. The attack fits tactical plan of wiping out enemy airpower.

# B-26

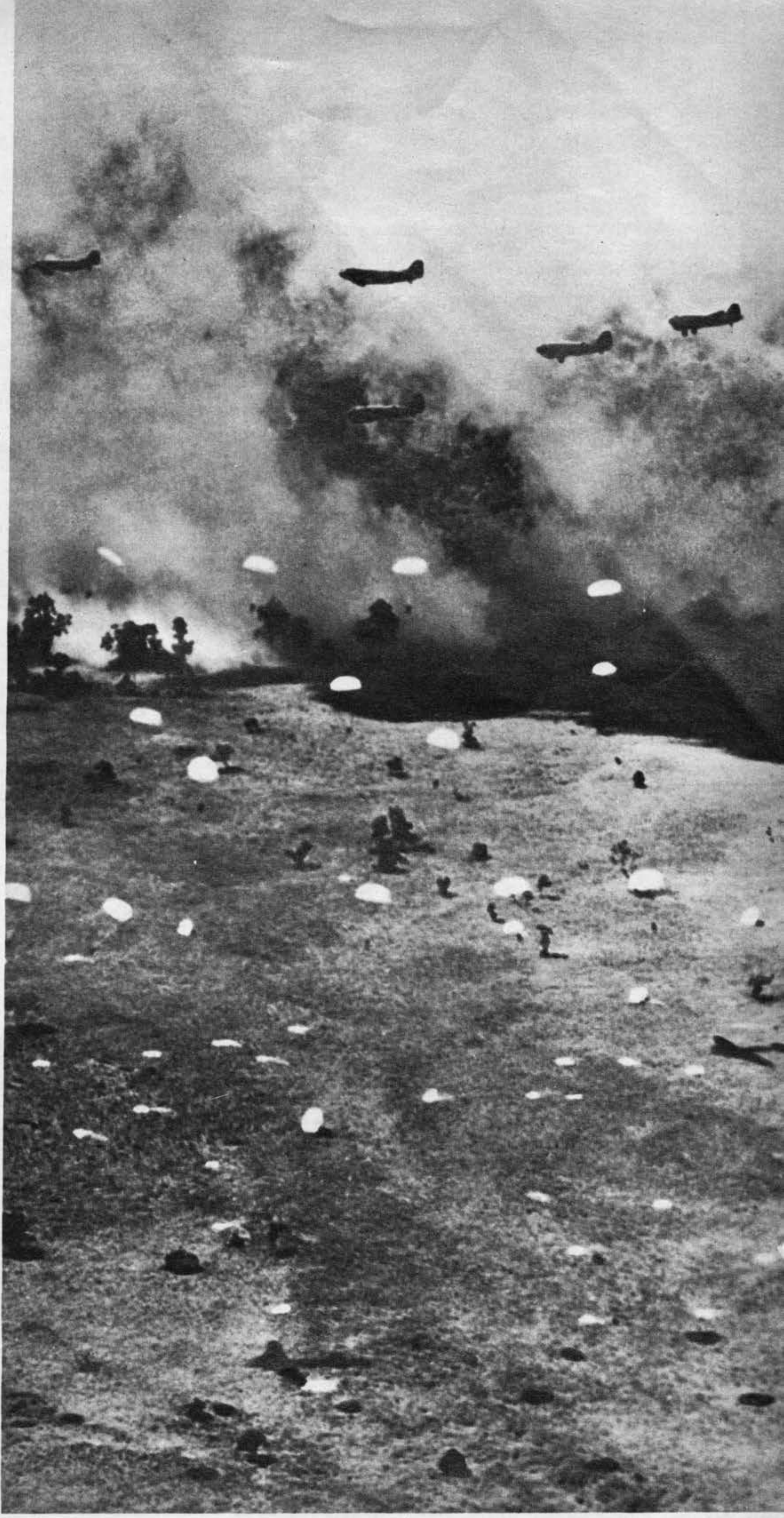
**Marauders zoom low** across the countryside on operational flight in England. The B-26 has exceptional range, speed, bomb load and firepower for its size, so that in the early days it got the reputation of being just too much plane for one pilot. Design changes and special crew training have overcome all objections and Marauder's great offensive power is making itself felt in several theaters. Its pilots are its most enthusiastic supporters.



**B-26's make their attacks** at better than 250 m.p.h. Usual strike is made in elements of two, with first plane strafing gun emplacements as second starts its run. In anti-shipping attacks in the African theater more than 105 missions were flown with a record of 60% direct hits, 15% near misses. Much of the plastering of the French coast has been done by Marauders, an activity in which losses have sunk to the amazingly low level of 0.3%.

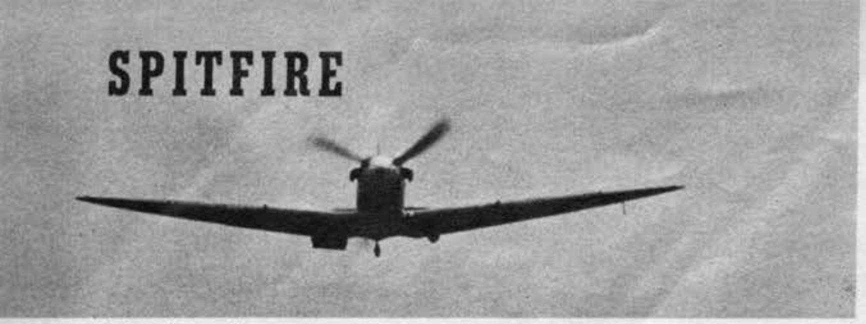


**C-47's** for airborne attack may have pararacks beneath the fuselage to carry troops' equipment. These racks may lead to confusion with bombers.

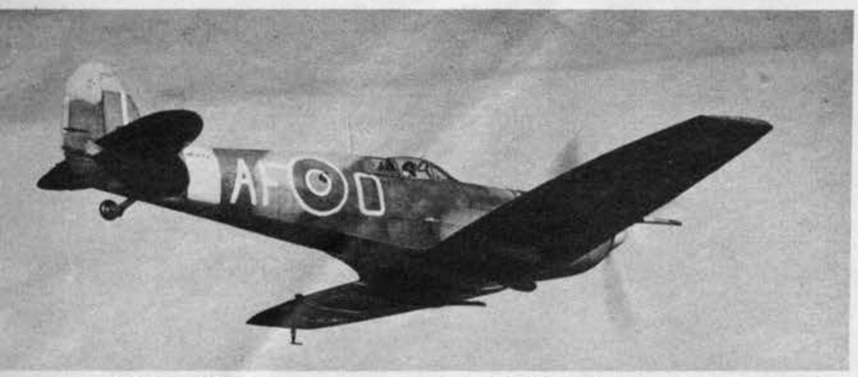


**Paratroops** float down from low flying C-53's. C-53 and C-47 are the same plane: C-53 carries troops, C-47, cargo. Many C-47's were lost to our own ground and ship batteries during the early stage of Sicilian campaign. Observers should note broad fin and rudder, bulky fuselage and sweptback wing.

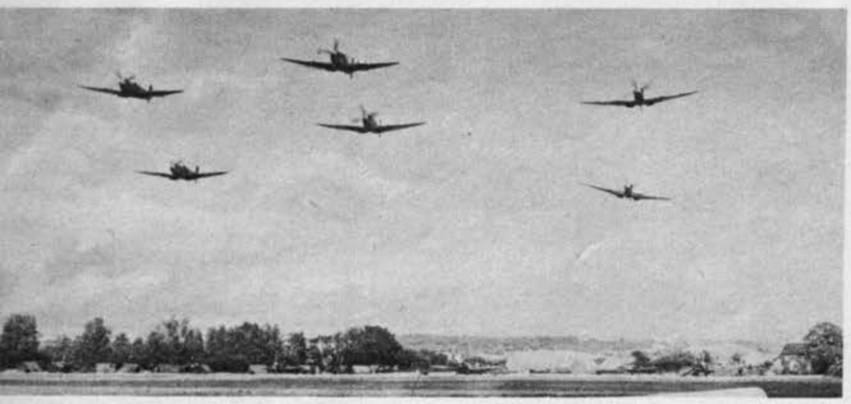
## SPITFIRE



**In head-on view** the Mark V Spitfire is distinguished from the more numerous Mark IX by its single radiator intake beneath starboard wing. In other views, the Spitfire's beautiful elliptical wing is its chief recognition feature.



**Clipped wings** of some models of the Spitfire give the plane better low-level maneuverability at the expense of fast climb. The Spitfire V is used in both forms, being made with detachable wingtips for quick adaptability.



**Spitfire IX** is currently the most numerous type in operation. Its chief job is flying high-altitude cover, but in large-scale operations the Mark IX will attack at lower levels, and will fly close cover for medium bomber missions.

# FROM DESERT WAR CAME NEW TACTICAL IDEA

Current Allied concepts as to the application of a tactical air force grew out of British experience in the Middle East and the African Desert. Our lessons were learned the hard way when the Luftwaffe had a numerical superiority in all theaters of war. But though they were outnumbered, the RAF Desert Forces had one supreme advantage: they were centralized under one control. For example, in June 1942, when the British Eighth Army was being pushed back nearly to Alexandria, Air Chief Marshal Tedder could pull out squadrons allotted to the Ninth Army fronts in Syria and the Levant and throw them into the battle on the Eighth Army front at El Alamein. Throughout the rest of the campaign, as General Montgomery said, "there existed in the Eighth Army a system which enabled the Army to obtain the fullest air support whenever and wherever necessary." In the final assault in Tunisia the Allied Tactical Air Forces literally blasted a path for the Army by the overwhelming weight and continuity of their attacks on a limited front.

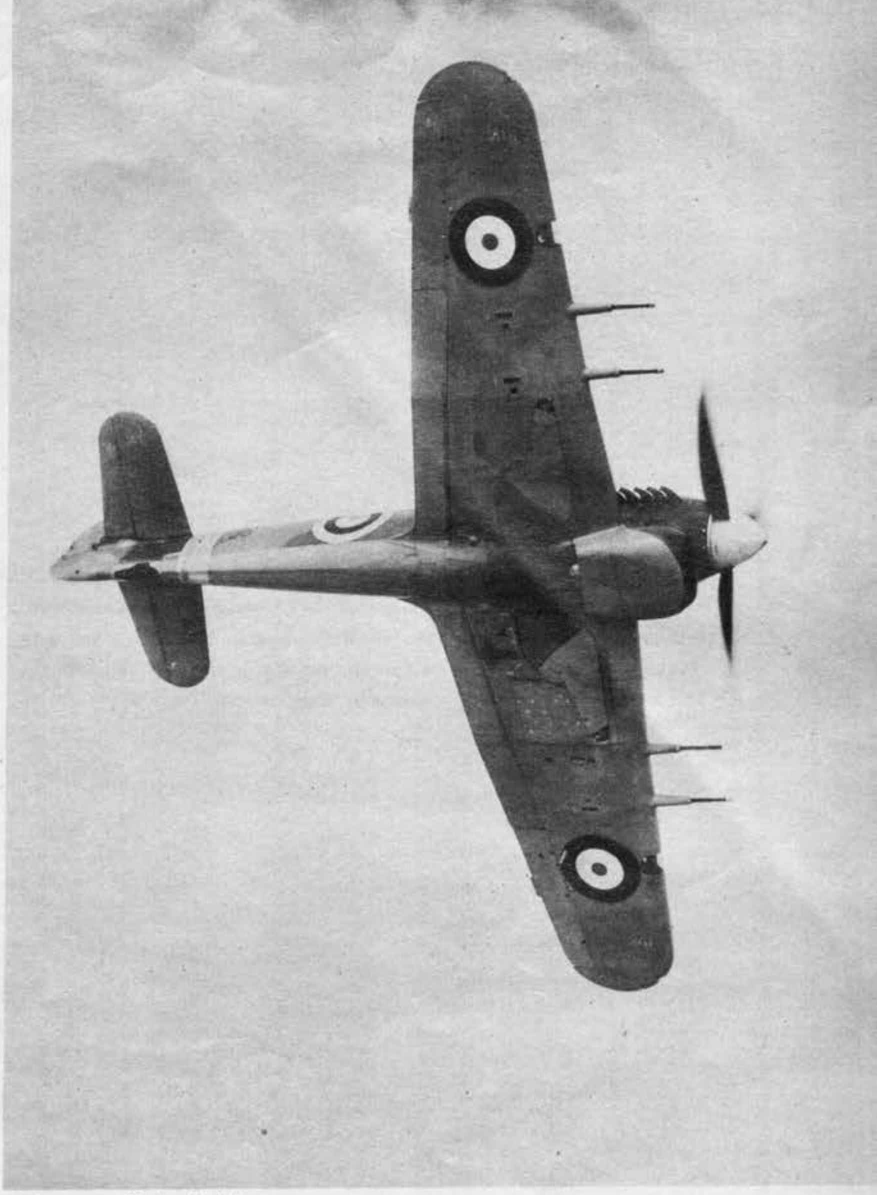
Most of the planes on the preceding pages of this article as well as the four craft on these and the following two pages are used in the Tactical Air Force. Through this separate organization much of the confusion in the tactical use of planes with ground forces has been cleared away. In North Africa, different planes of different commands were performing the same work; planes best adapted to certain work were often not available to the command which needed them while other commands might have a surplus. But through the close co-operation of ground and air chiefs, a fusion has been created that is of great advantage to the overall plan. Never has such intimate support been achieved before.

**Spits with bombs** were first used as an anti-shipping measure from land bases on the Island of Malta. The bomb load usually consisted of two 250-lb. missiles which were carried on external bomb racks. Since then, the low-altitude versions have been used against land targets on the Italian front. Though design of the Spitfire is adaptable to most small-plane uses, they have not been used as fighter-bombers unless other planes were scarce.

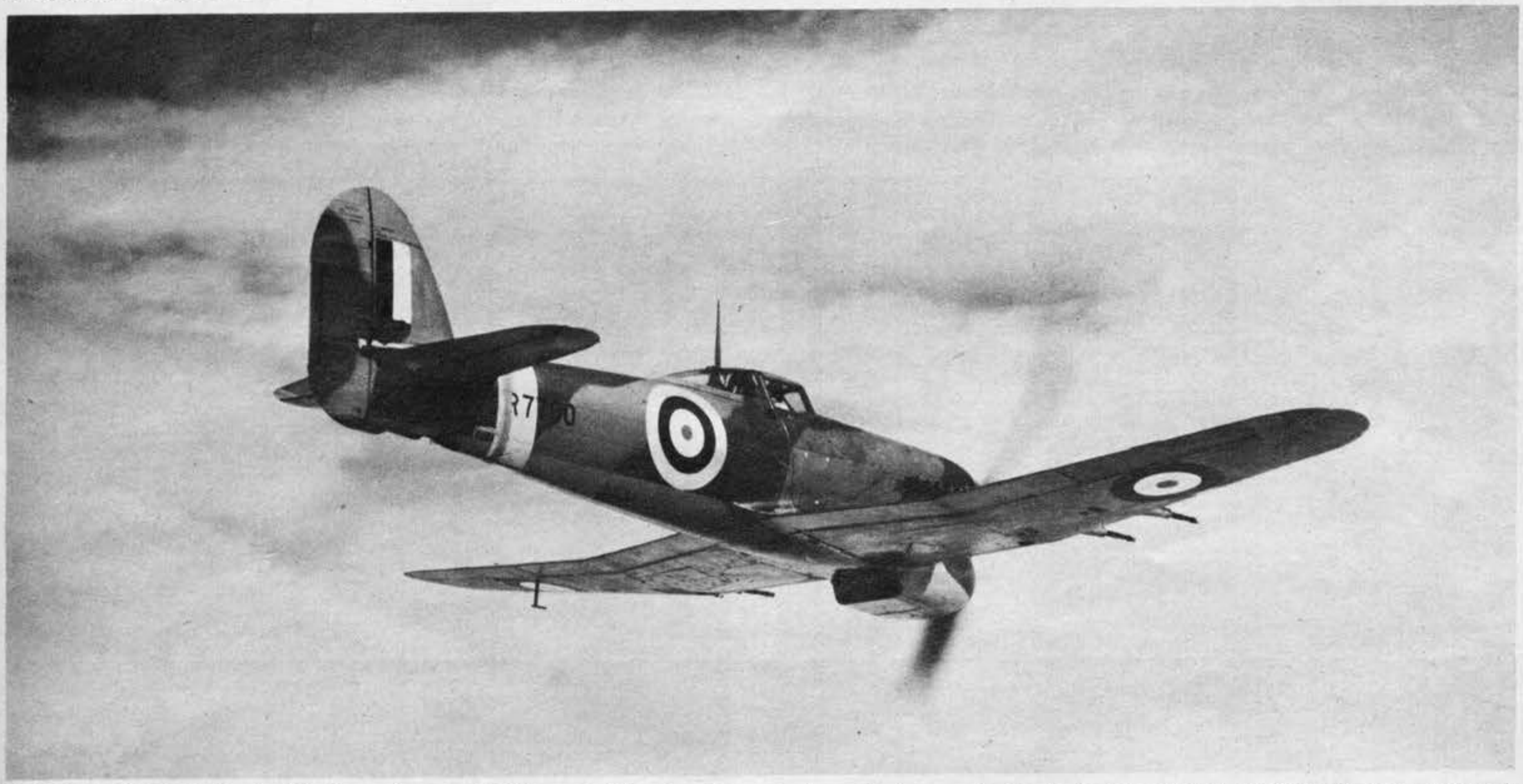
# TYPHOON

**The Typhoon** is RAF's best fighter-bomber. Though originally conceived as fighter replacement for the Hurricane, it has been an even greater success as a divebomber, carrying four 250-lb. bombs or two 500-pounders.

**Typhoon's guns** are wing-mounted, may be alternatively four cannon or twelve machine guns. With its high rate of climb and great maneuverability, it can outperform most enemy fighters after dropping its bombs.

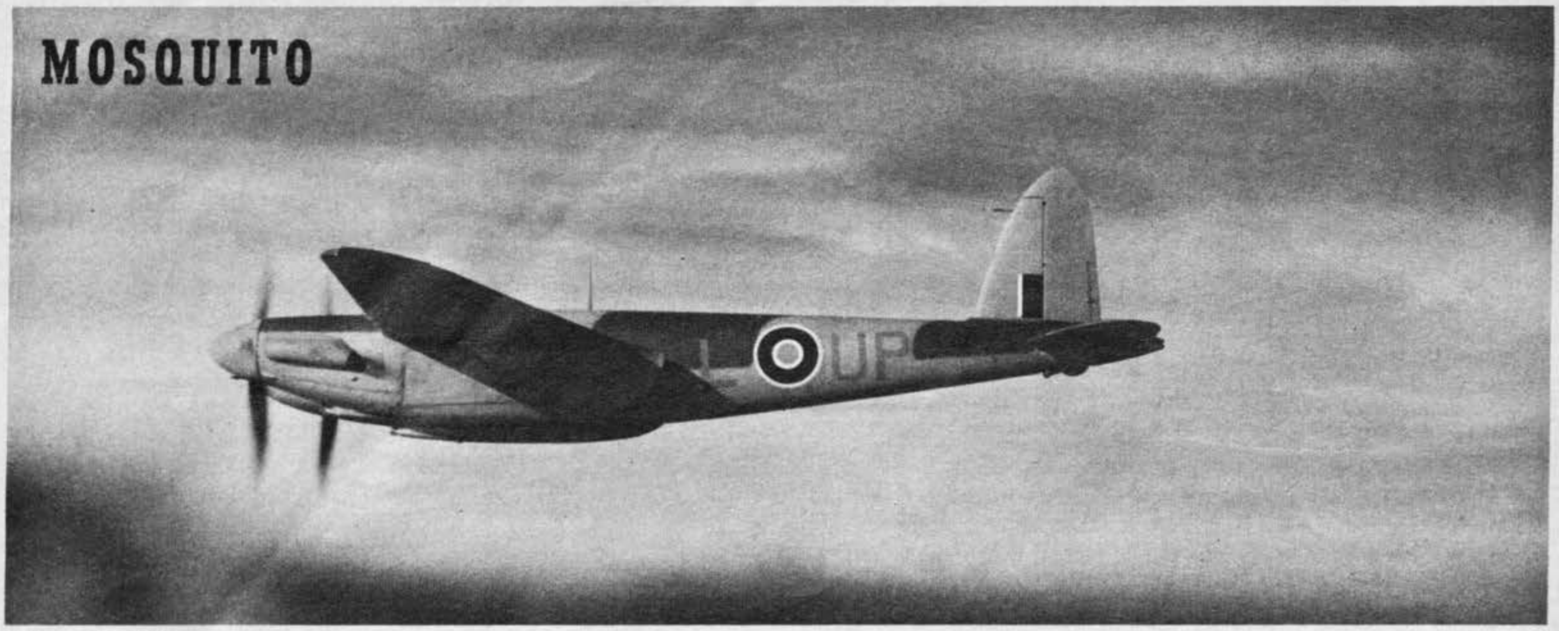


**Bulbous radiator intake** beneath the nose, broad fin and rudder, and flat inverted gull wing are features of the Typhoon's construction. It is one of the most distinctive inline-engine fighters currently operating in ETO.

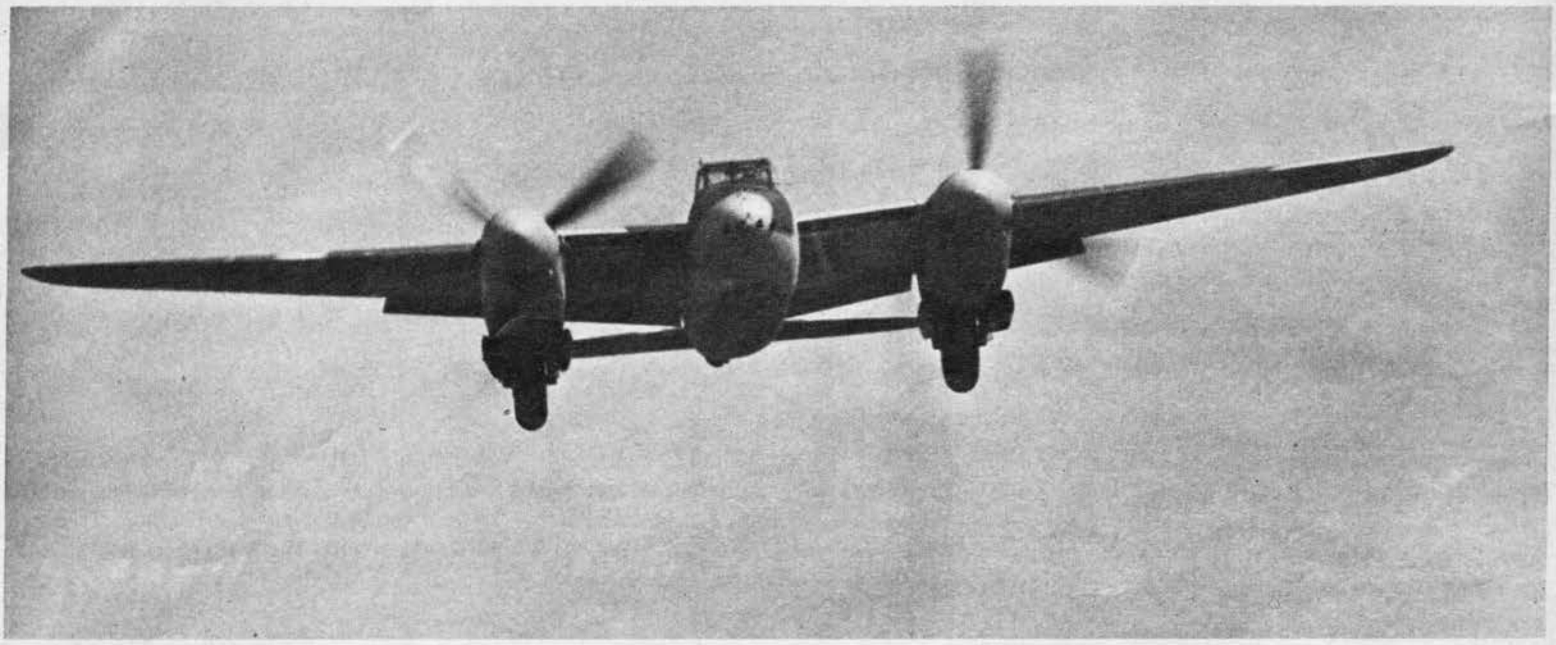


**Diving at 470 m. p. h.,** the Typhoon gives its 500-lb. projectile a terrific initial velocity which makes the bomb doubly effective because of its greater penetrative force. In bad weather, the plane makes low-level-attacks on trains, gas tanks, factories and other targets. In approaching, it flies at zero altitude to confuse the enemy's radar installations; or it cuts around behind obstructions to give a fleeting image on the radar screen.

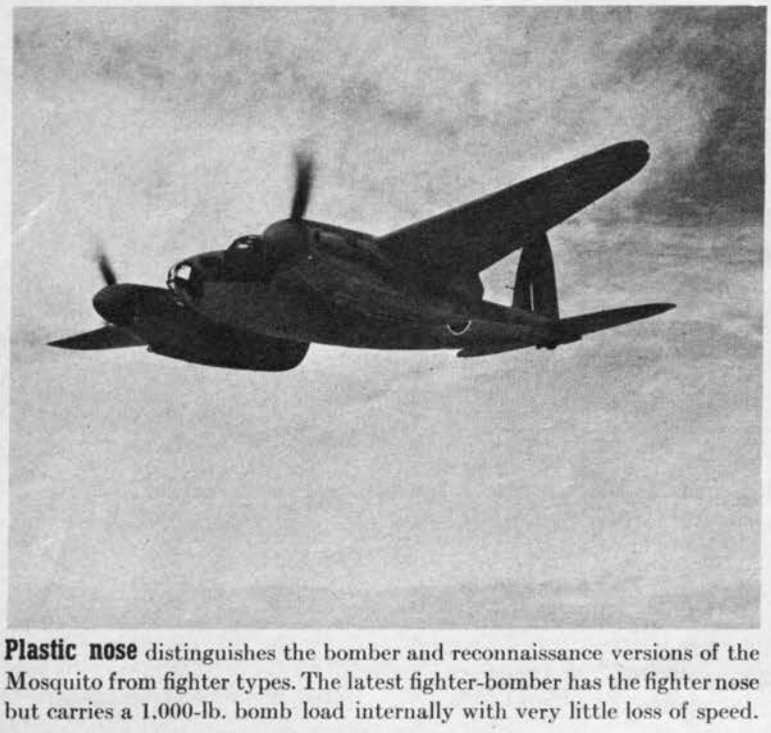
# MOSQUITO



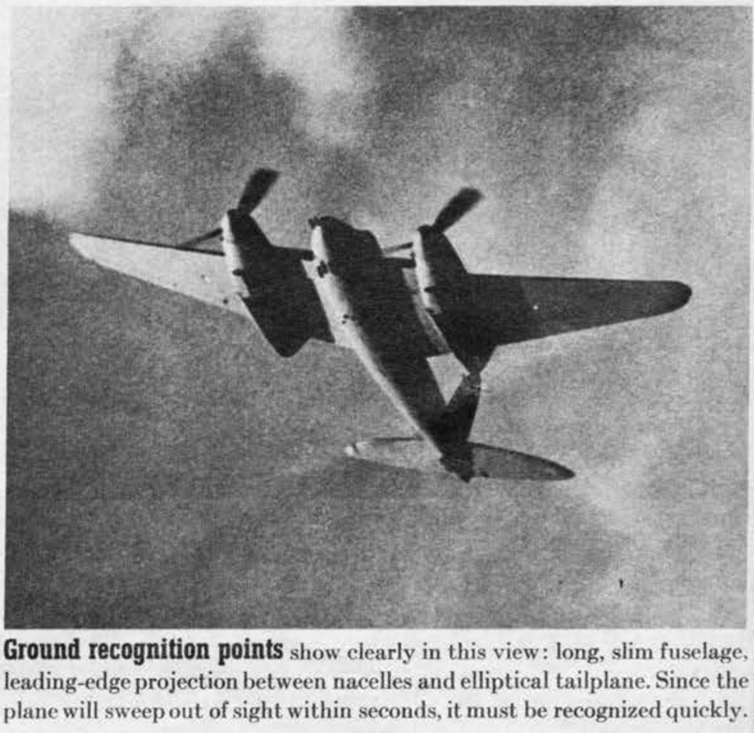
**A three-fold job** falls to one of the sleekest airplane designs of the war, the De Havilland Mosquito. Most famous version is the intruder bomber which has a habit of showing up over Germany during Nazi party shivarees. Another model is Britain's fastest photo-reconnaissance plane, used in photographing the results of air attack and reconnoitering. A third type, which mounts four cannon and four machine guns, is a nightfighter.



**Fighter model** of the Mosquito has its guns concentrated in the nose to fire straight ahead. This arrangement avoids the converging-diverging fire that is necessary when guns are mounted in the wings. The Mosquito's four machine guns are about center-level in the nose and its cannon fire from recesses beneath the nose. The weight of fire thrown by these weapons is heavy enough to knock out even the most heavily armored aircraft.

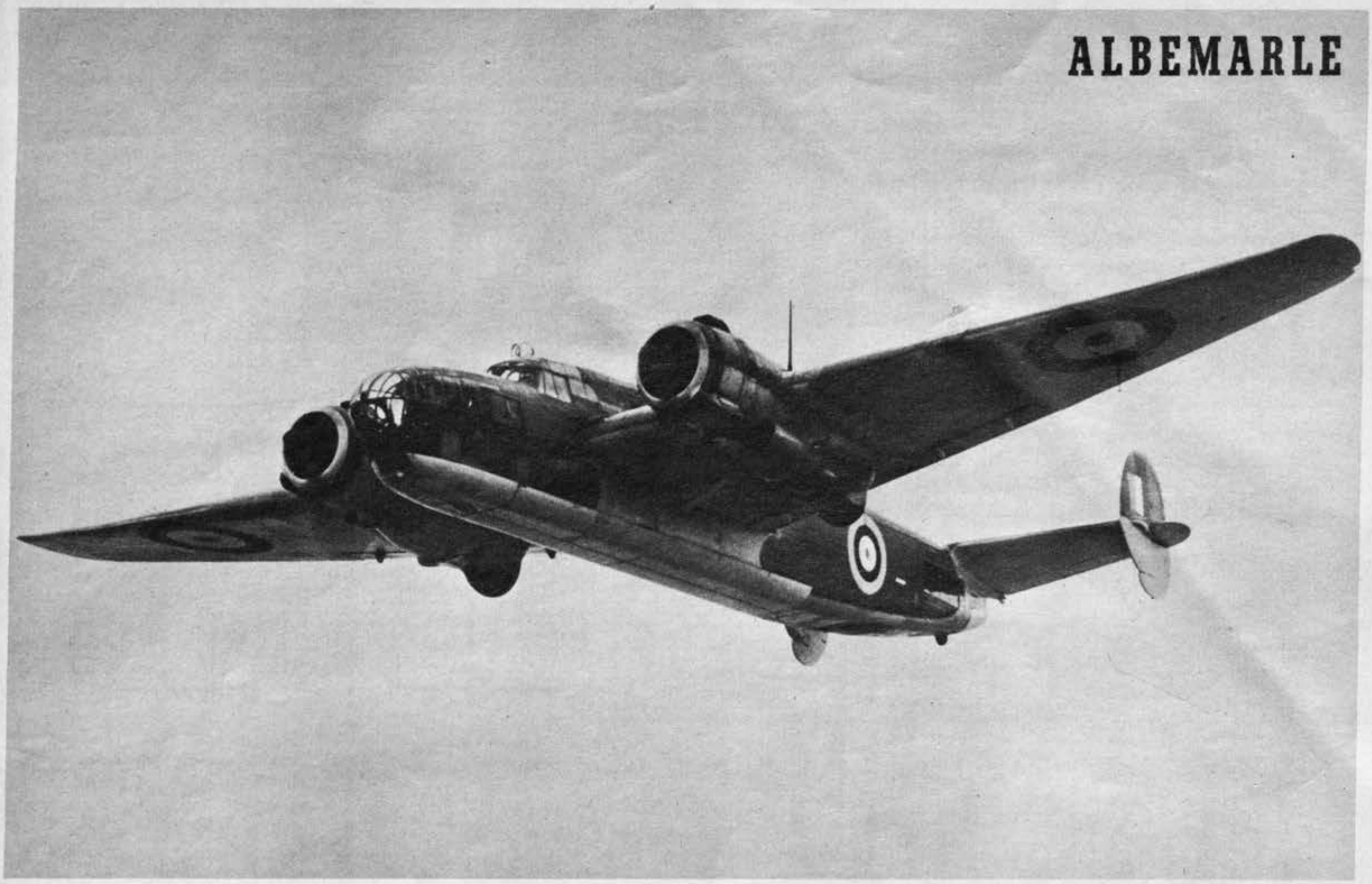


**Plastic nose** distinguishes the bomber and reconnaissance versions of the Mosquito from fighter types. The latest fighter-bomber has the fighter nose but carries a 1,000-lb. bomb load internally with very little loss of speed.

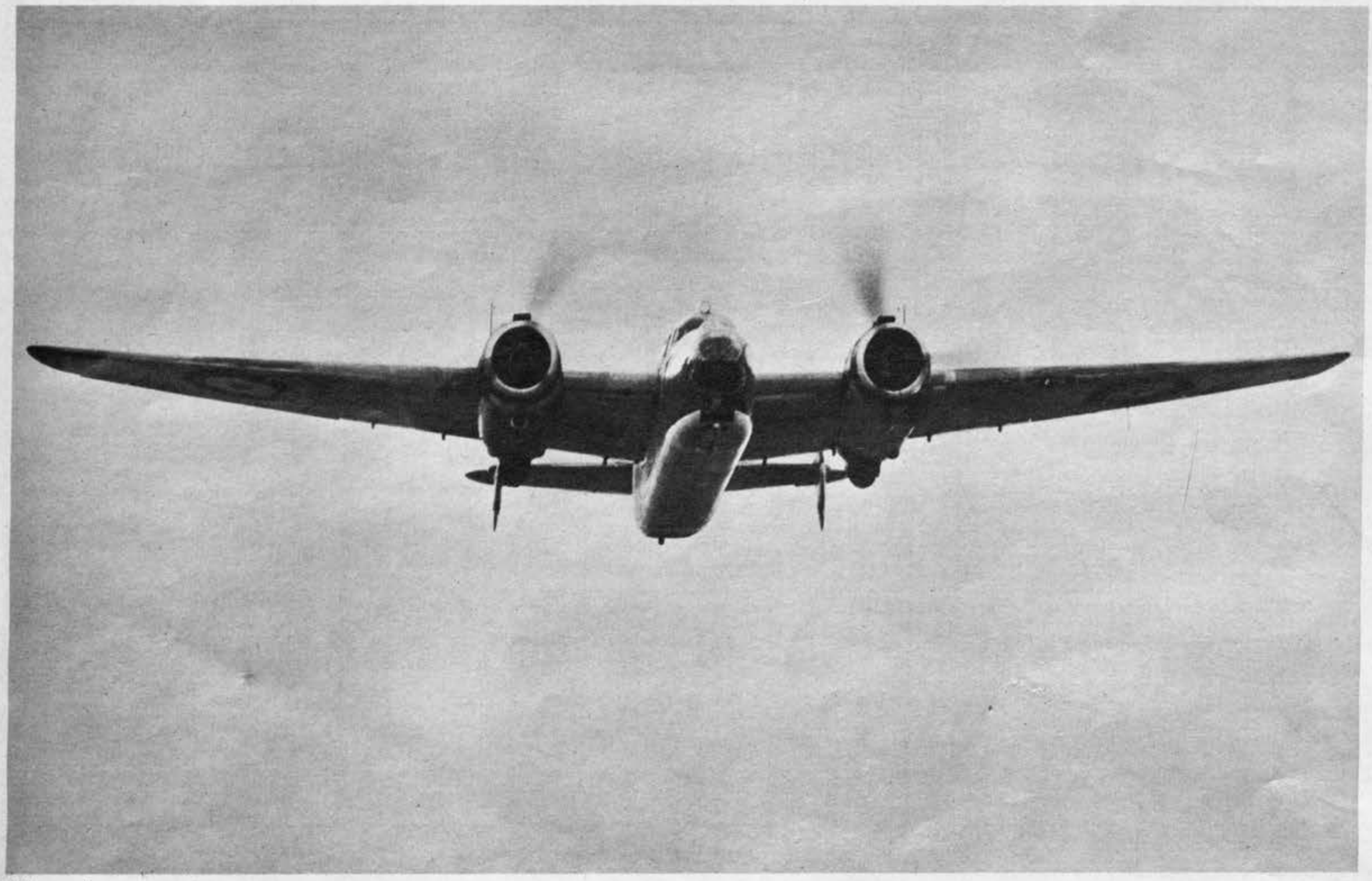


**Ground recognition points** show clearly in this view: long, slim fuselage, leading-edge projection between nacelles and elliptical tailplane. Since the plane will sweep out of sight within seconds, it must be recognized quickly.

# ALBEMARLE



**One of the first planes** to land Allied troops in Sicily was the recently announced Albemarle. It went into production three years ago and since appearing has been used to carry mail, for general transport work, and for glider-towing. It was originally designed to operate as a medium bomber, but with the shift to big bombers, Albemarle has been adapted to troop carrying. In this capacity, it is now the RAF's counterpart of the C-53.



**Albemarle** is a twin-engine, twin-tail monoplane. Its midwing is broad and tapers equally on both edges. The fins and rudders are long ovals set slightly inboard of the tailplane. The fuselage is bulky and has a distinctive glassed-in after section. The whole tail assembly is set high on the fuselage. Except for the tail, the airplane somewhat resembles the Wellington. As more pictures become available, the *Journal* will print them.

# LOW-FLYING AIRCRAFT

## COMMON ALLIED AND AXIS TYPES

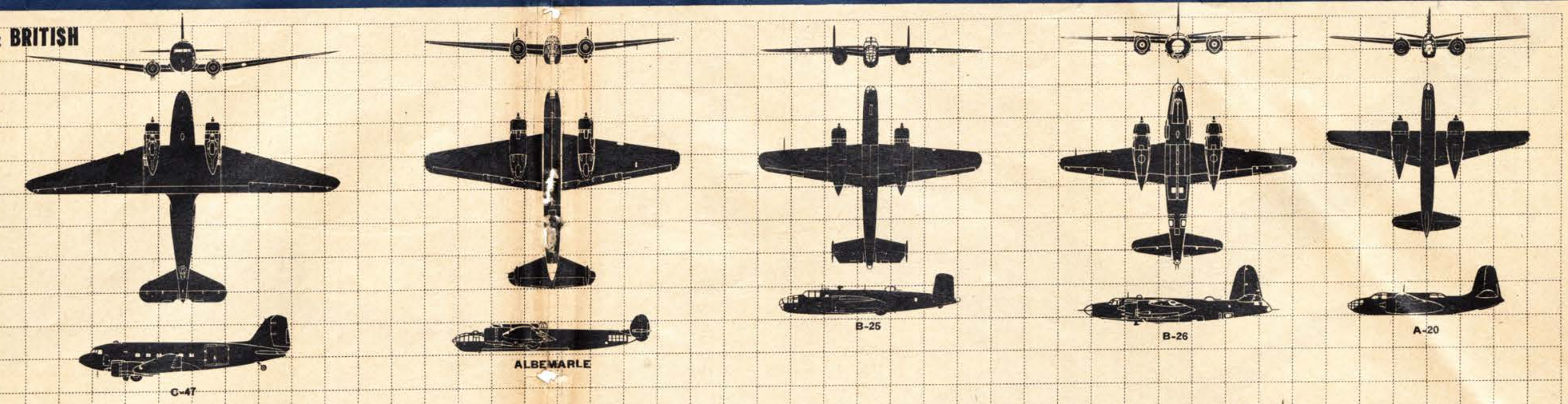
RESTRICTED

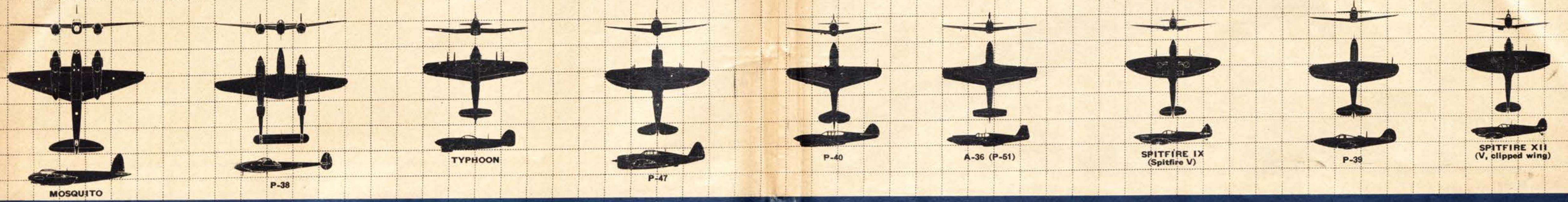
The Allied and Axis planes that are most likely to be encountered flying at low altitudes over land operations are represented in the 28 groups of silhouettes on these two pages. Each individual plane is pictured in the customary three different views—head-on, plan, and beam. Fourteen U.S. and British types at top of the spread are arrayed against 14 key Axis planes shown in the bottom section.

Certain of these planes are used primarily in the low-altitude work for which they were designed or adapted. Many of the others are versatile aircraft which may be found at high altitudes, but which also have been engaged in low-level action. All of them are of primary concern to ground troops.

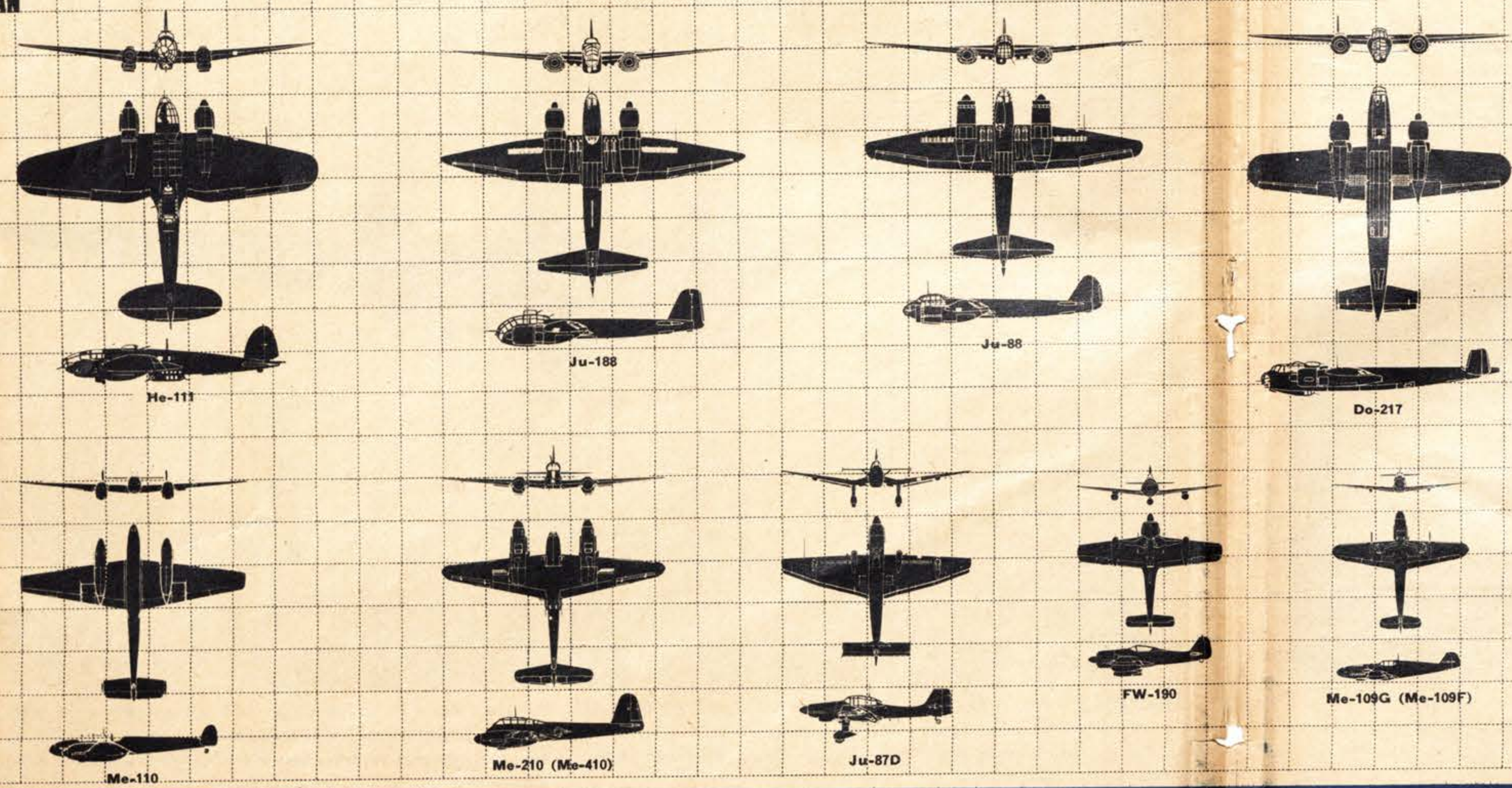
SCALE: EACH SQUARE EQUALS 10 FT.

## U.S. & BRITISH

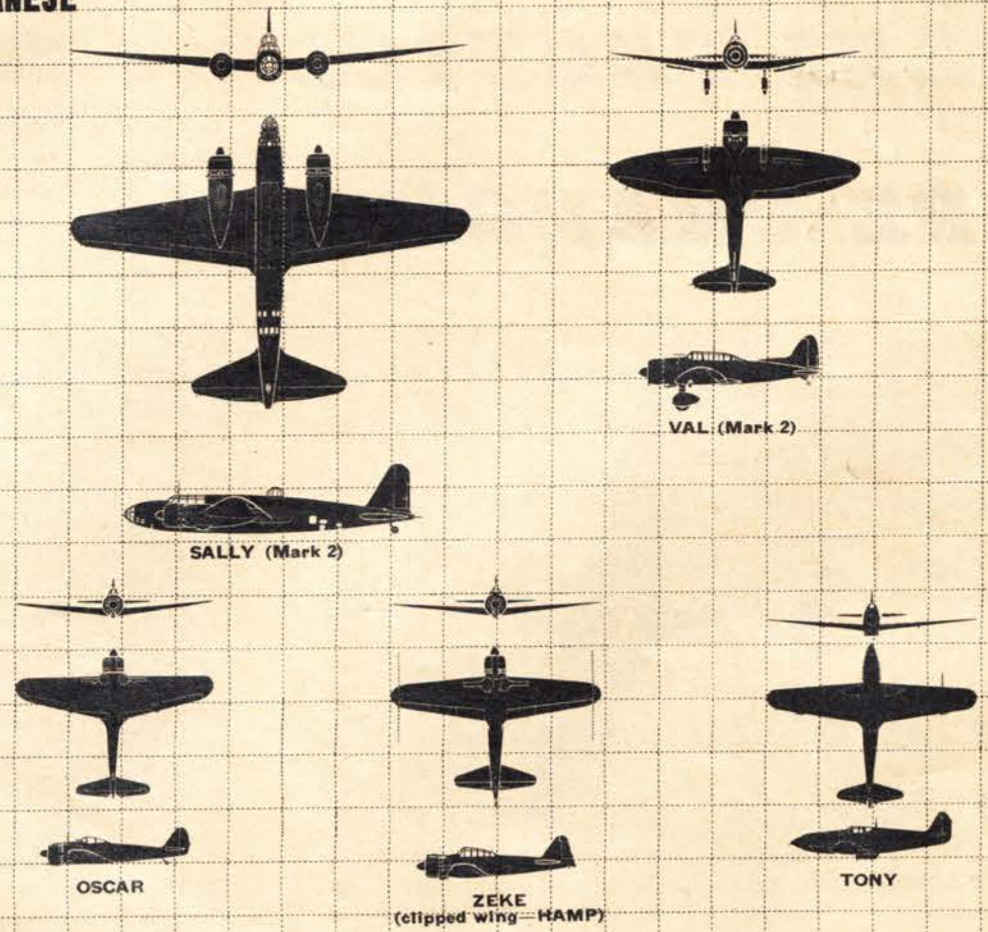

C-47
ALBEMARLE
B-25
B-26
A-20


MOSQUITO
P-38
TYPHOON
P-47
P-40
A-36 (P-51)
SPITFIRE IX
(Spitfire V)
P-39
SPITFIRE XII
(V, clipped wing)

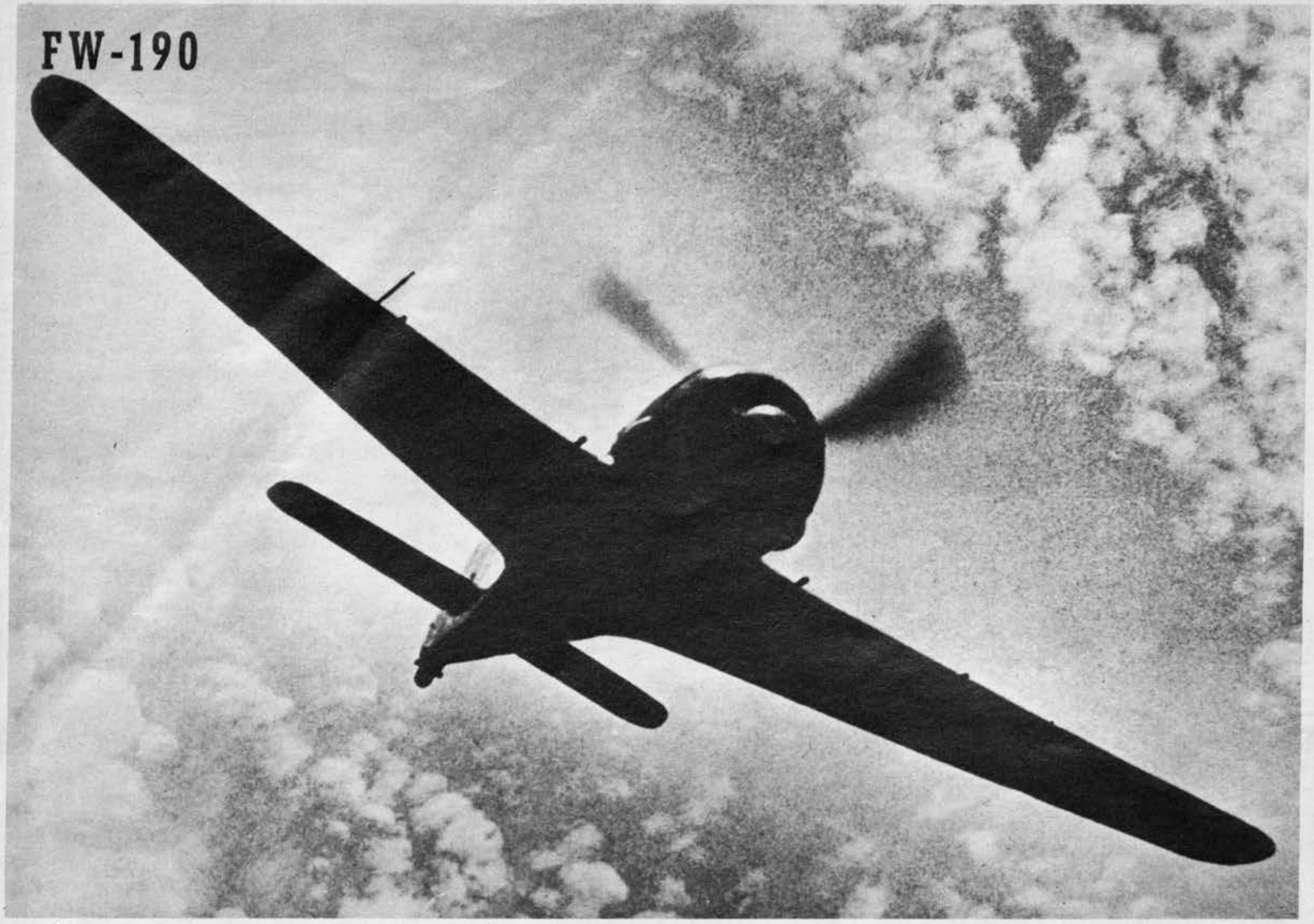
## GERMAN


He-111
Ju-188
Ju-88
Do-217
Me-110
Me-210 (Me-410)
Ju-87D
FW-190
Me-109G (Me-109F)

## JAPANESE


VAL (Mark 2)
SALLY (Mark 2)
OSCAR
ZEKE
(clipped wing—HAMP)
TONY

## FW-190

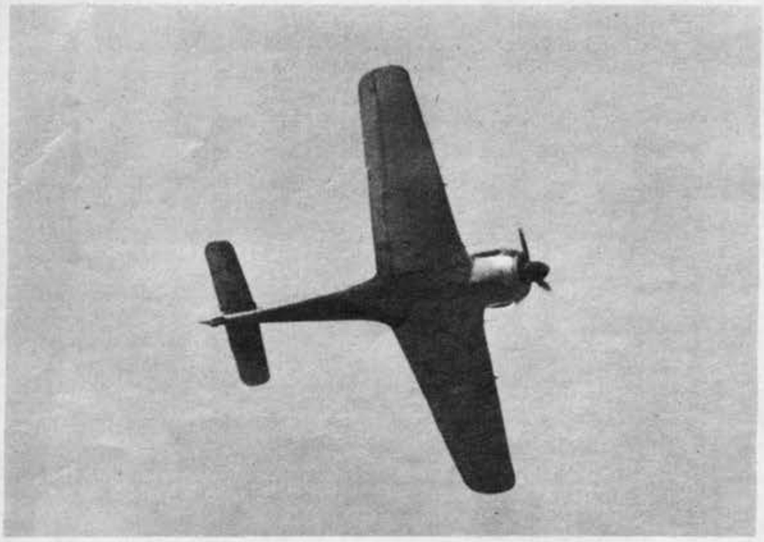


**Fortunes of war** have caused the Luftwaffe to follow the lead of the Allies in converting fighters to fighter-bomber use. The FW-190 and Me-109 (*see facing page*), the Nazis' best fighter planes, have both been adapted for work near the ground. The Focke-Wulf has been acquiring heavier guns, capable of piercing light armor. An important recognition point, from almost any angle, is the heavy appearance of the cowling around the radial engine.

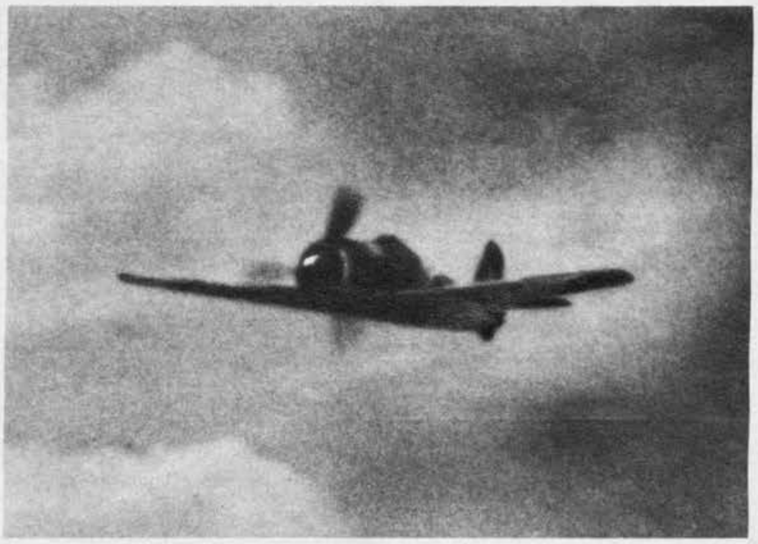
# NAZI TACTICS ARE CHANGING

In swift drives through Poland and France, German airpower was beautifully coordinated with the land forces. A strong fighter command swept the air clear of weak defensive forces; waves of bombers flew unmolested against assembly points behind the lines. Screaming Stukas harassed retreating forces with bombs.

But German techniques required complete air superiority. When the RAF gained its strength, the Nazi air war plan began to break down. Now the Germans are on the defensive in the air.

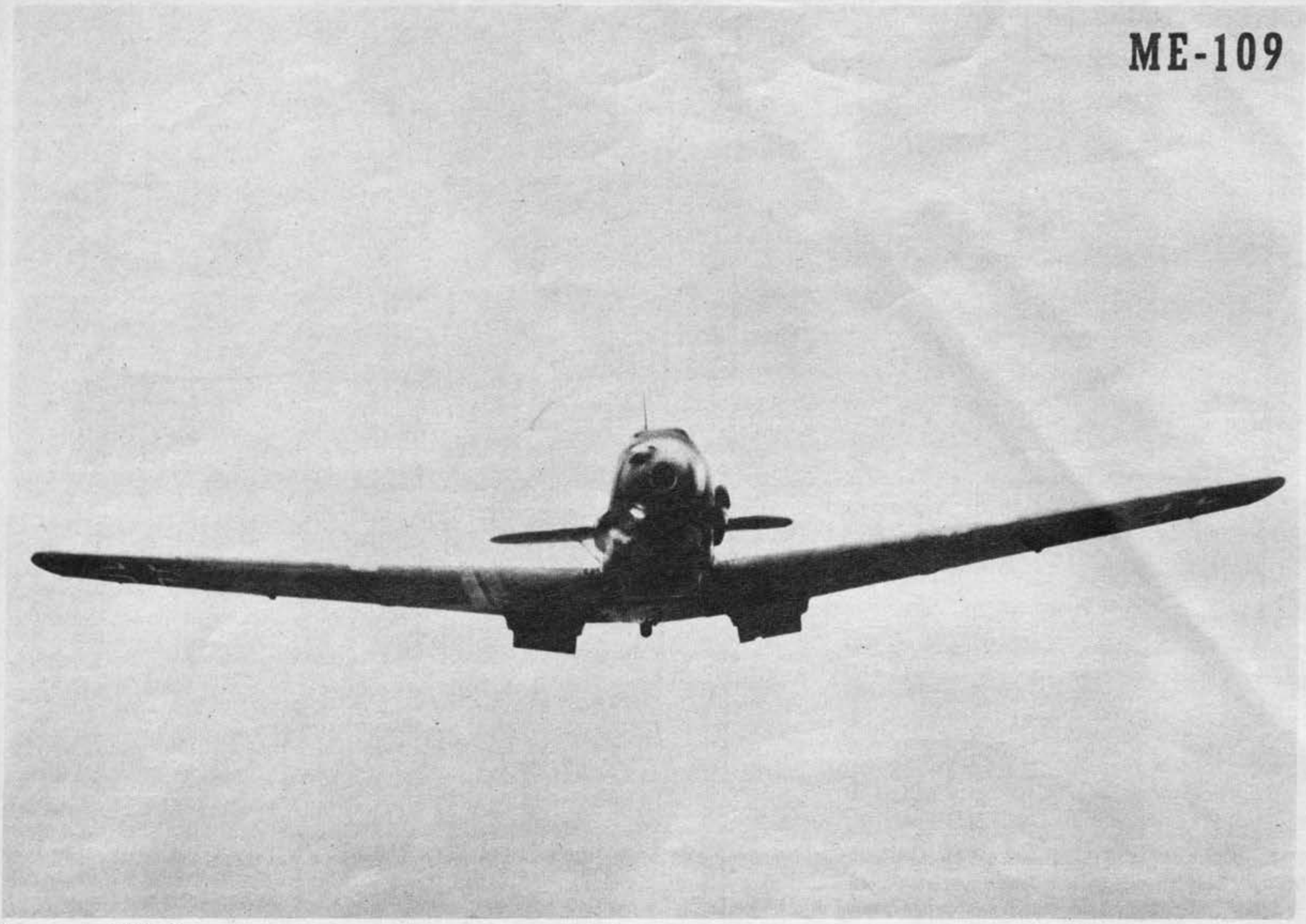


**FW-190's bomb load** for fighter-bomber action is usually 550 lb. but it can carry up to 1,100 lb. Because the Luftwaffe planned on close support, the plane has a short range unless speed-cutting auxiliary fuel tanks are used.

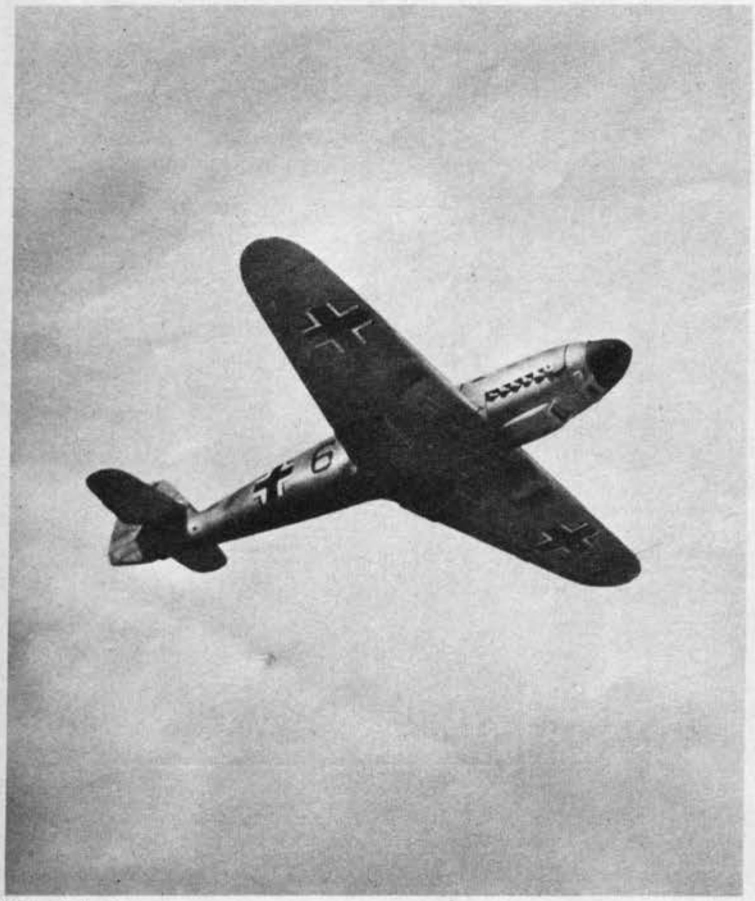


**Important points** in recognizing the FW-190 are its moderately tapered wing with little dihedral and squarish tips; the pronounced taper of its fuselage. Its large radial BMW engine gives the airplane a bulky nose.

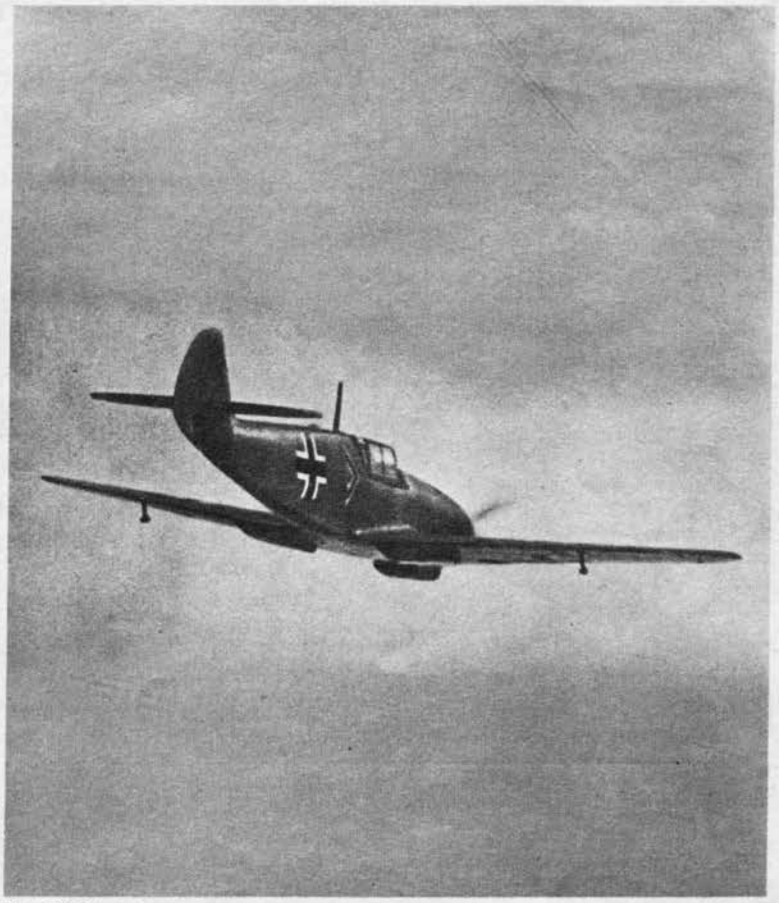
# ME-109



**Messerschmitt-109E** was the leading German fighter of the early part of the war. After the Battle of Britain it became obsolescent but has recently been reported as being back in action, possibly because it could be produced quickly to replace expended German fighter strength. During Allied raid on Dieppe the square wingtips of this model caused a great deal of confusion with the Mustang, which saw its first mass action in this great raid.

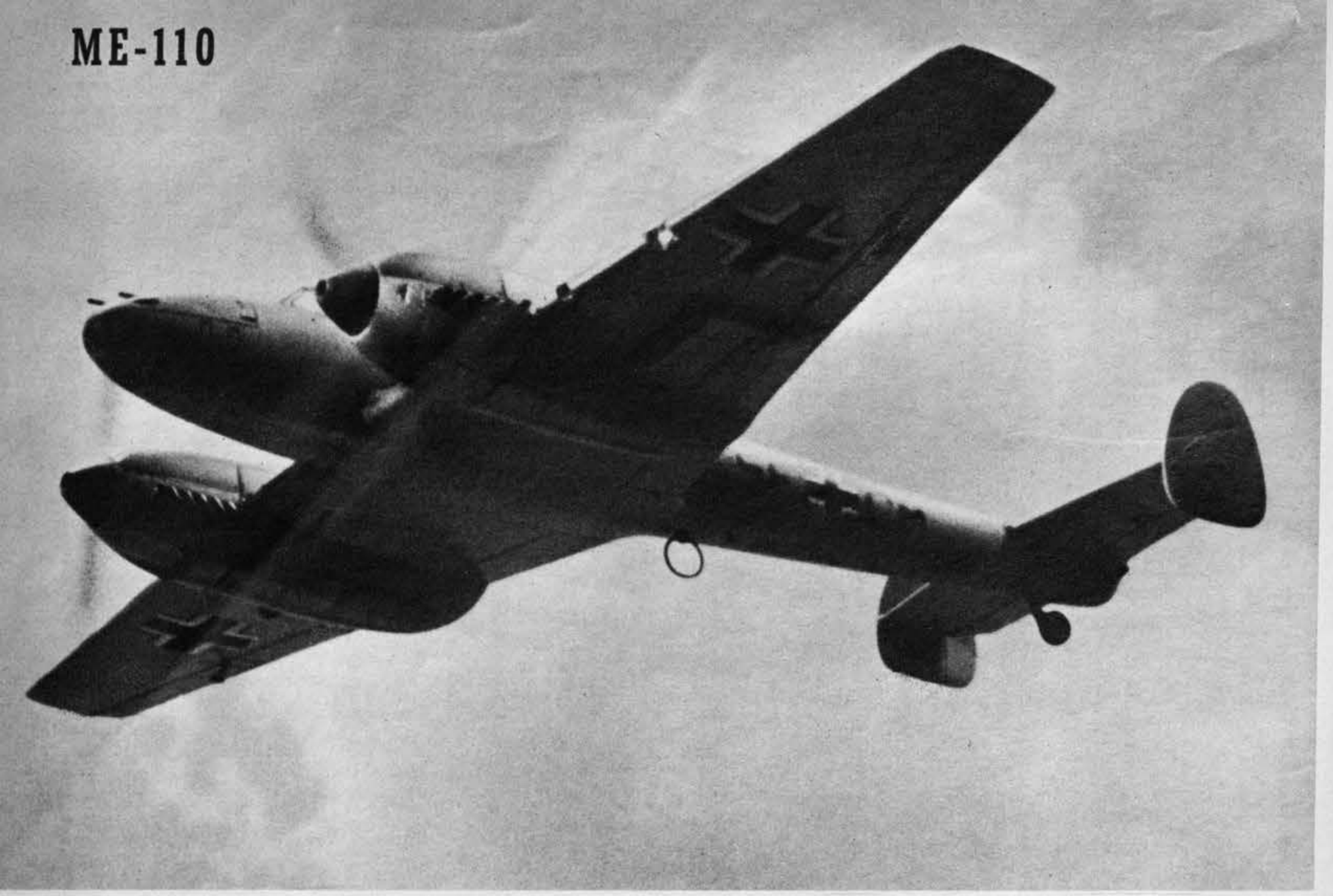


**F model** of the Messerschmitt has been replaced by the Me-109G for high-altitude defensive fighting, but like some of the FW-190 models it is now serving as a fighter-bomber. Its armament includes a hub-firing cannon.

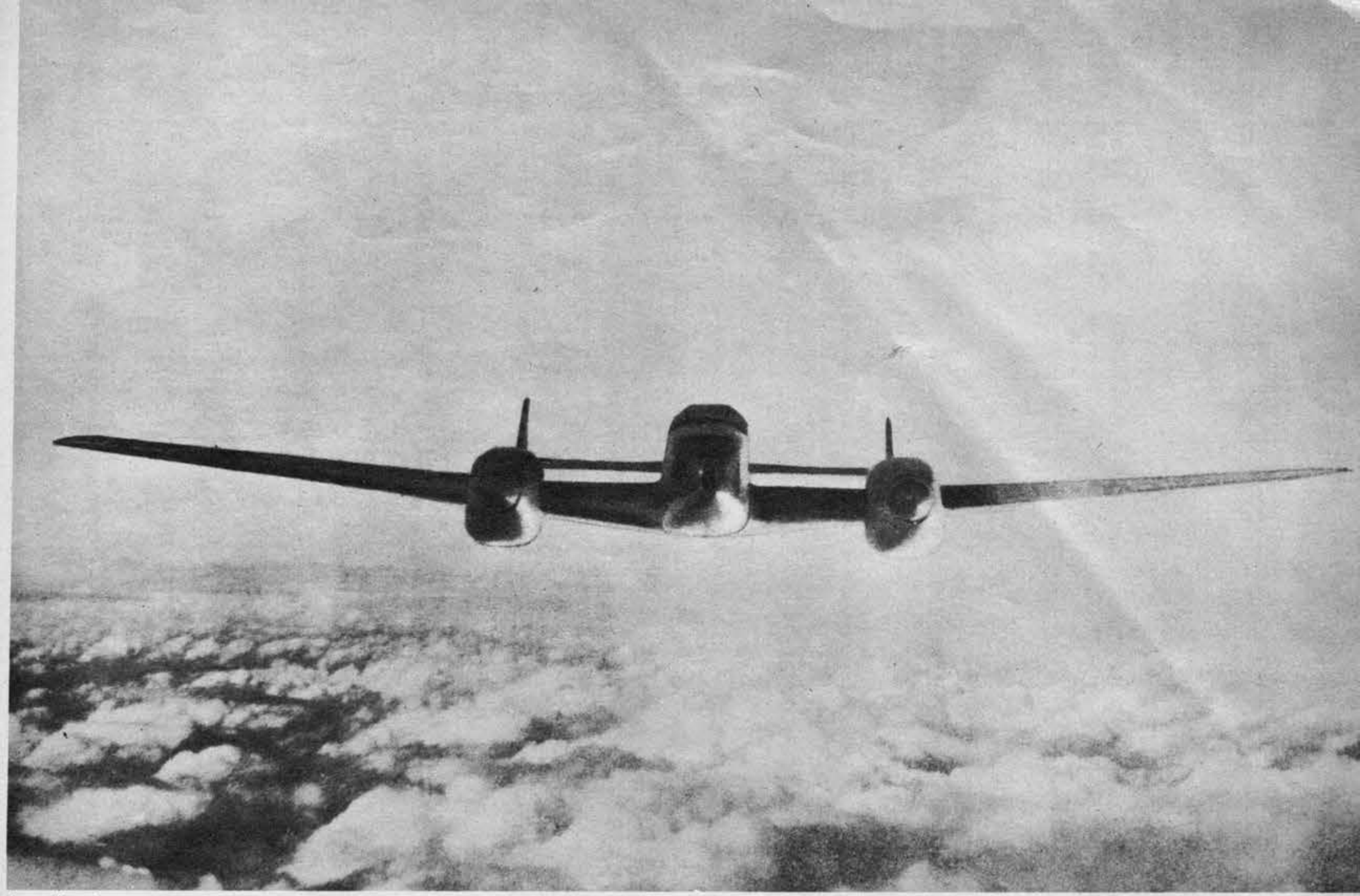


**Me-109G** finds its chief use in attacks on our high-flying bombers but one version of plane is used for photo-reconnaissance. In this activity it may be seen by ground forces. Family resemblance among all types is very close.

# ME-110

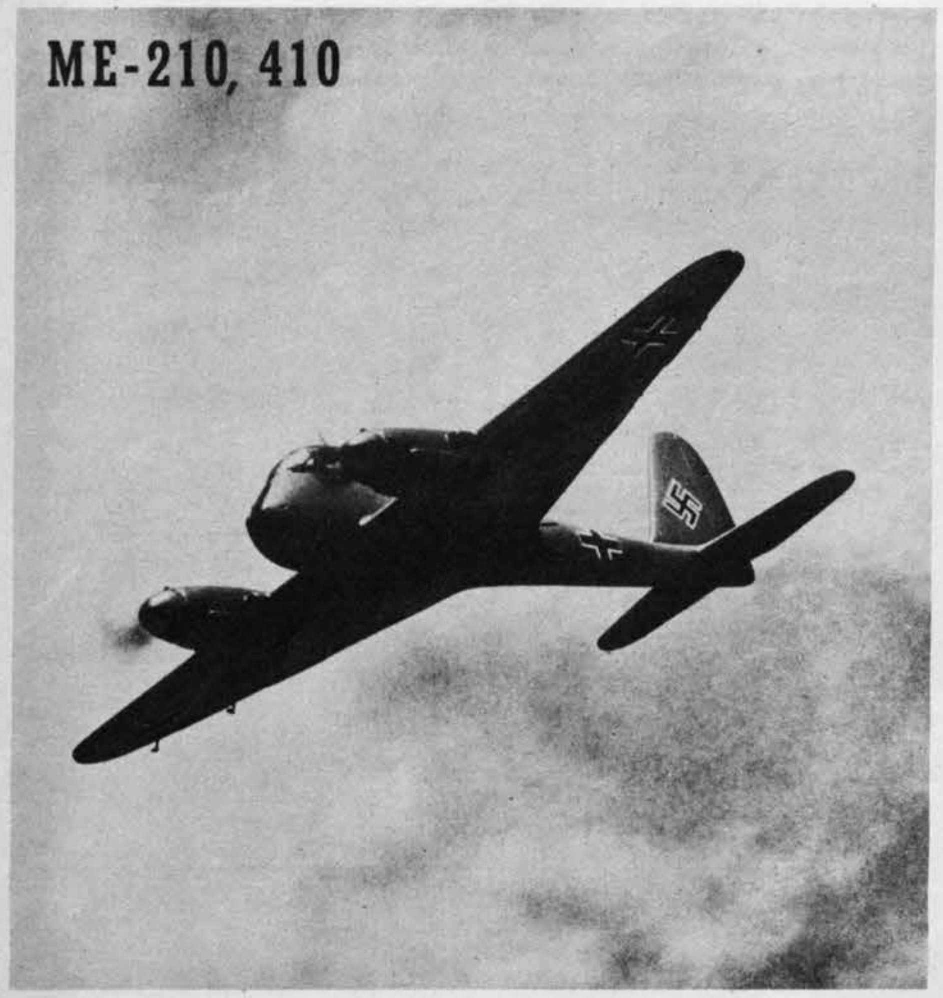


**Twin-engine series** of the operational Messerschmitt line began with the Me-110. This supposedly hot fighter has lately been a consistent failure as a day fighter. It first saw action as a cannon-armed attack bomber in the 1939 Polish campaign but when it was turned against the British it took a terrific beating. It was then withdrawn from the war in the west and has since been used exclusively on the Russian and North African fronts.

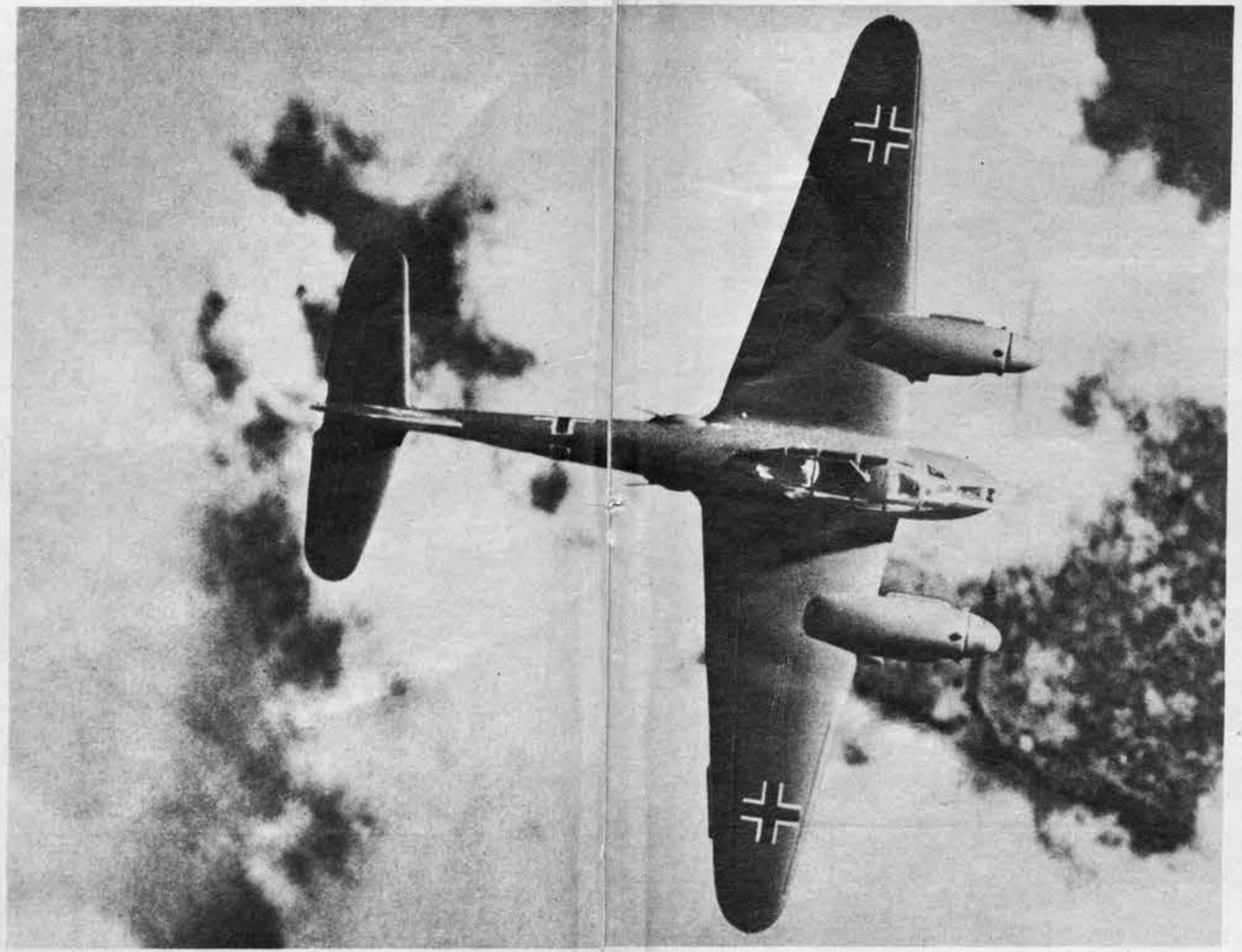


**As a bomber,** the Me-110 carries either one 2,200-lb. bomb or two 1,100-lb. bombs on external racks under the fuselage as well as four 110-lb. bombs under the wings. With this load, its speed is estimated at 325 m.p.h. for a range of 725 miles. It may have as many as six guns firing forward; two cannon and two machine guns in the nose; two machine guns in the bomb bay. In combat Me-110 has never lived up to the Luftwaffe's expectations.

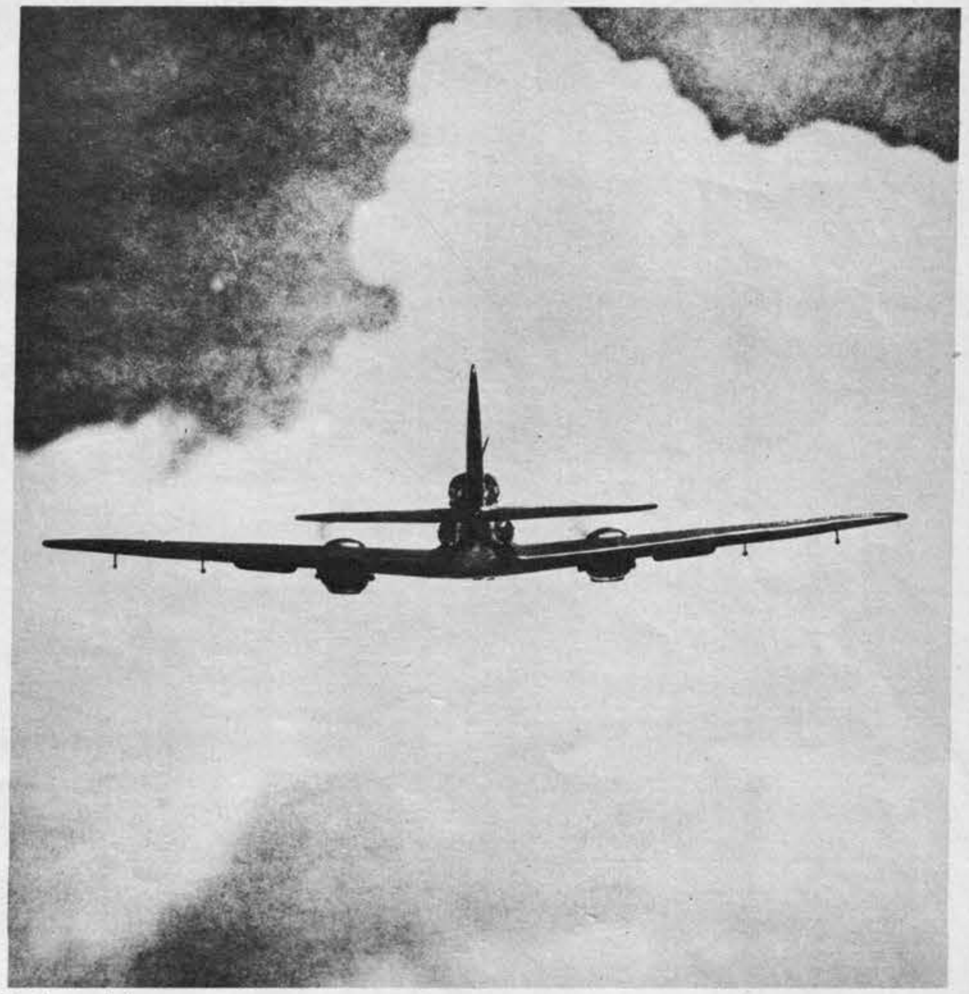
# ME-210, 410



**Me-210 and 410** have taken over most of the duties of the Me-110 and have performed them more successfully. The pictures shown here are of the Me-210 but the 410 is nearly identical though combat reports indicate that it may have a sturdier airframe, greater power.

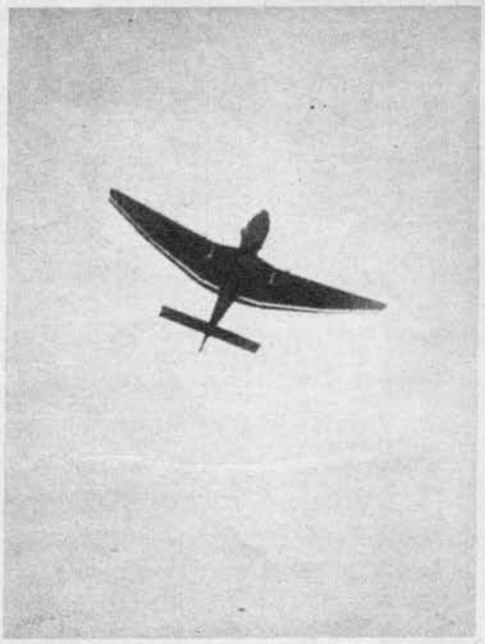


**Unique feature** of the Me-210's armament are the two remotely controlled guns aft of the wing. A third rear-firing gun may be mounted in the tail for strafing after the plane has made its bombing run. The remotely controlled guns are aimed by the rear gunner; the tail gun is fired by the pilot who aims by maneuvering the plane.

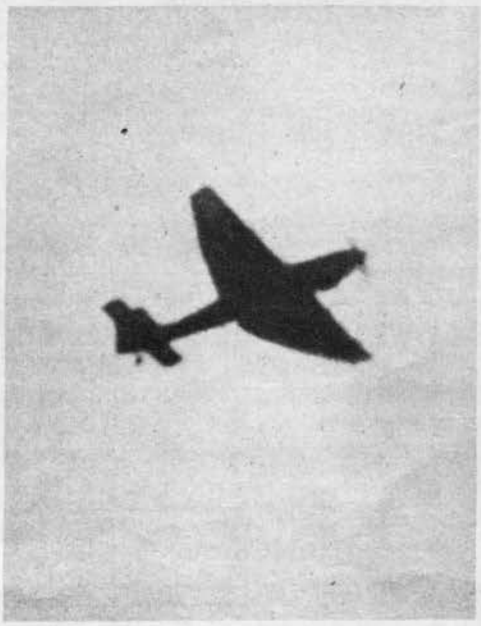


**Both models** 210 and 410 are all-purpose airplanes. They have been used as fighters, dive-bombers, horizontal bombers, ground attack and reconnaissance planes. Bomb load may be as high as 3,300 lb., though the 1,000 lb. of armor carried should cut into the effective load.

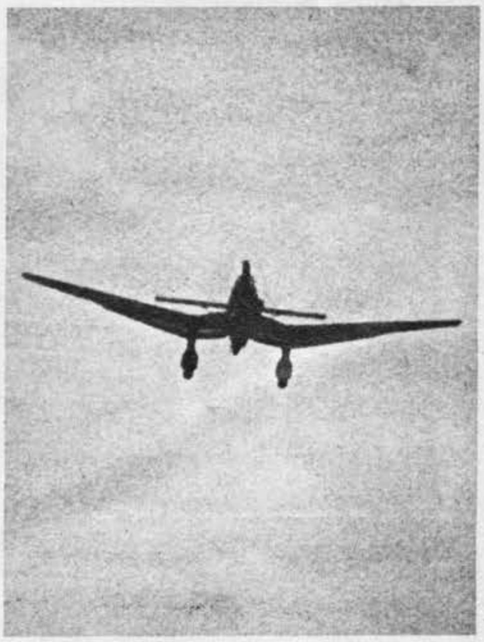
# JU-87D



**Terror weapon** of the early war, the Stuka is now only in limited use against Anglo-American forces. It is slow, vulnerable to AA and fighters.

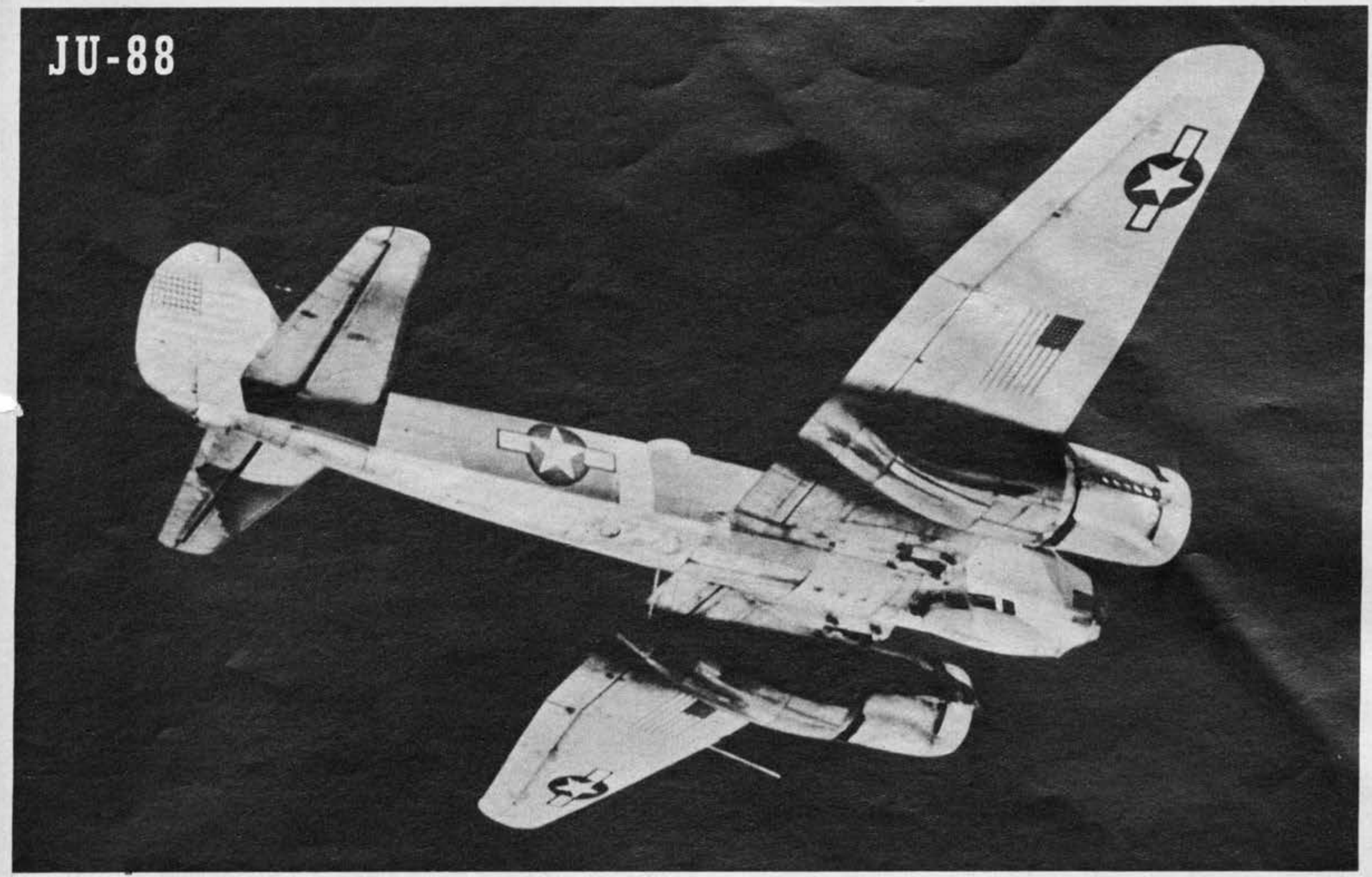


**Ju-87D,** the latest model, has a shallow inter-cooler under the nose and radiators under the wings. But it is still recognizable as the Stuka.



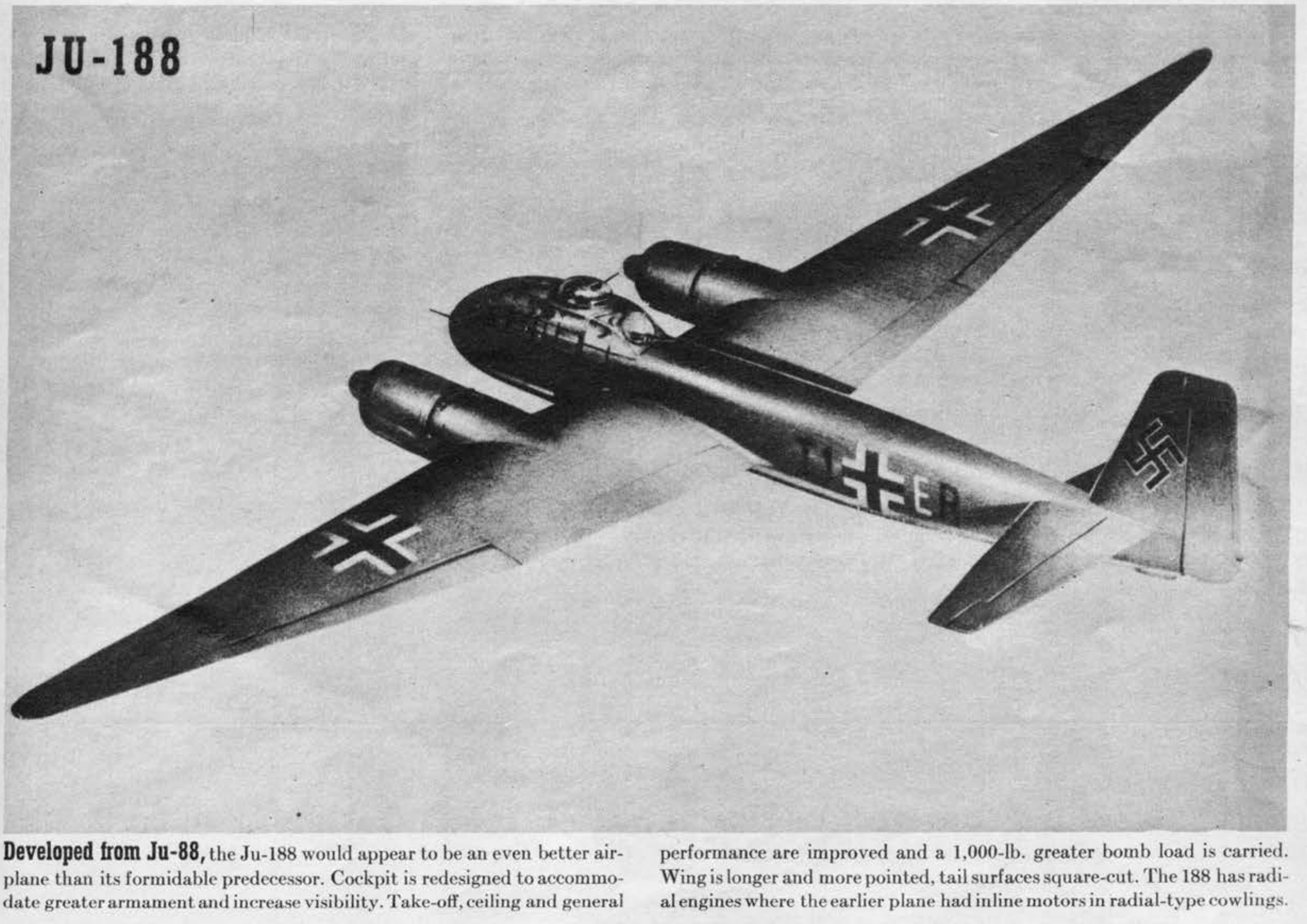
**Fixed landing gear,** inverted gull wing, ugly angular fuselage give Ju-87 its personality. Its looks are more terrifying than its performance.

## JU-88



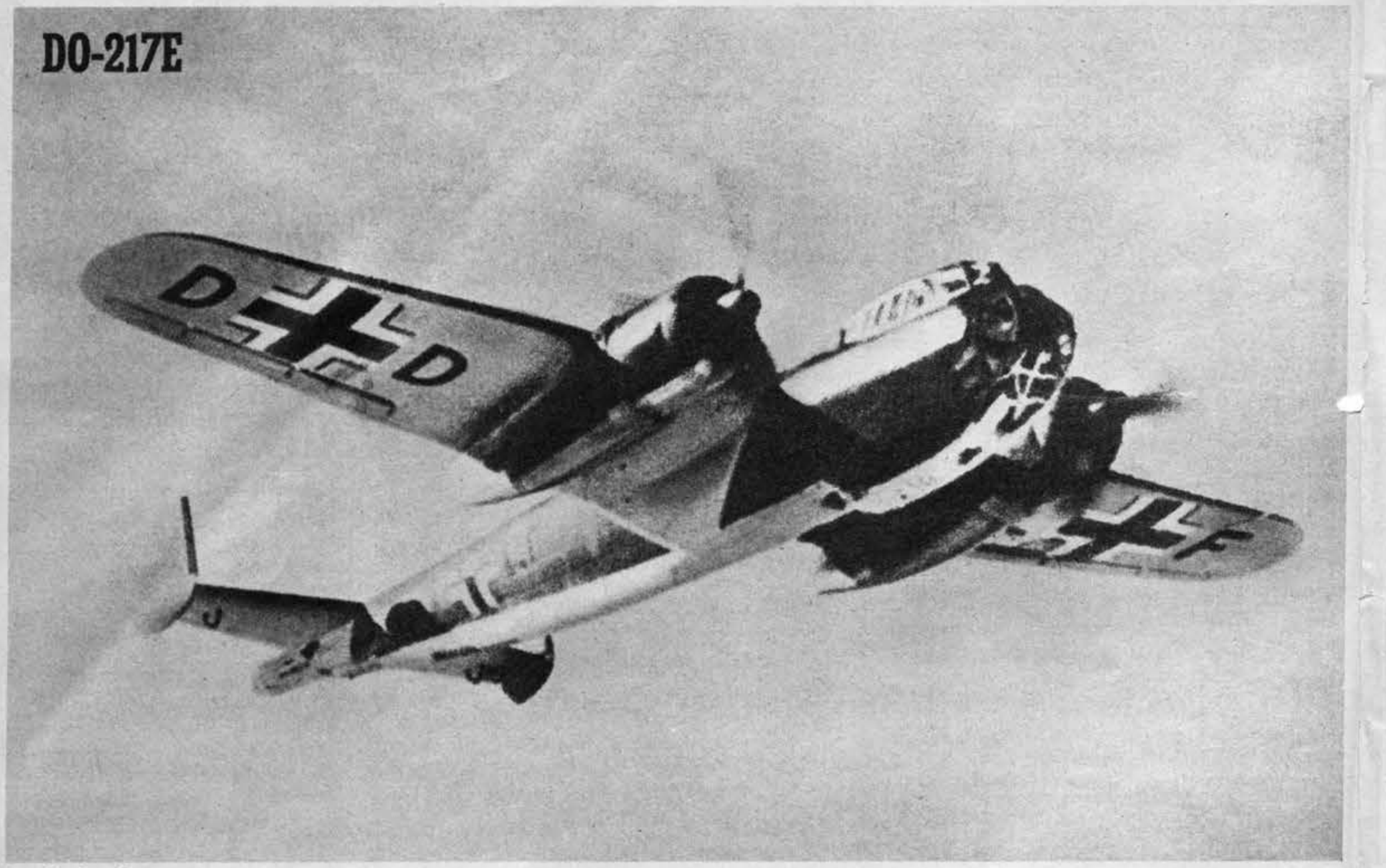
**The most versatile plane** developed by the Germans has been the Ju-88 series. Credited with twenty operational uses it has been used as a bomber, divebomber, torpedo plane, minelayer, ground attack and photo-reconnaissance craft, and nightfighter. It has long range, speed of over 300 m.p.h. for latest models and a bomb capacity of three tons. The plane shown has been thoroughly tested at Wright Field and has impressed Army engineers.

## JU-188

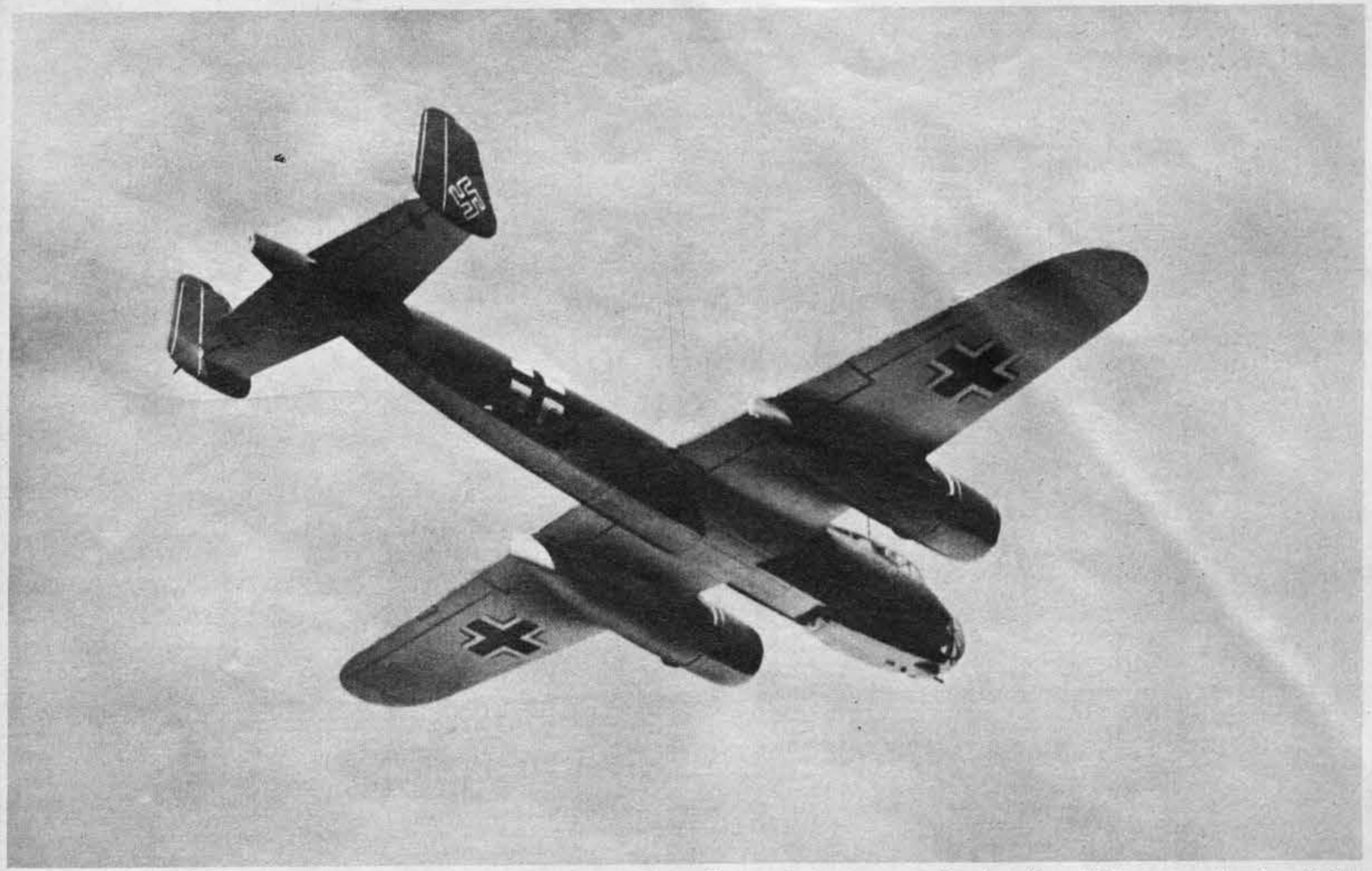


**Developed from Ju-88,** the Ju-188 would appear to be an even better airplane than its formidable predecessor. Cockpit is redesigned to accommodate greater armament and increase visibility. Take-off, ceiling and general performance are improved and a 1,000-lb. greater bomb load is carried. Wing is longer and more pointed, tail surfaces square-cut. The 188 has radial engines where the earlier plane had inline motors in radial-type cowlings.

# DO-217E



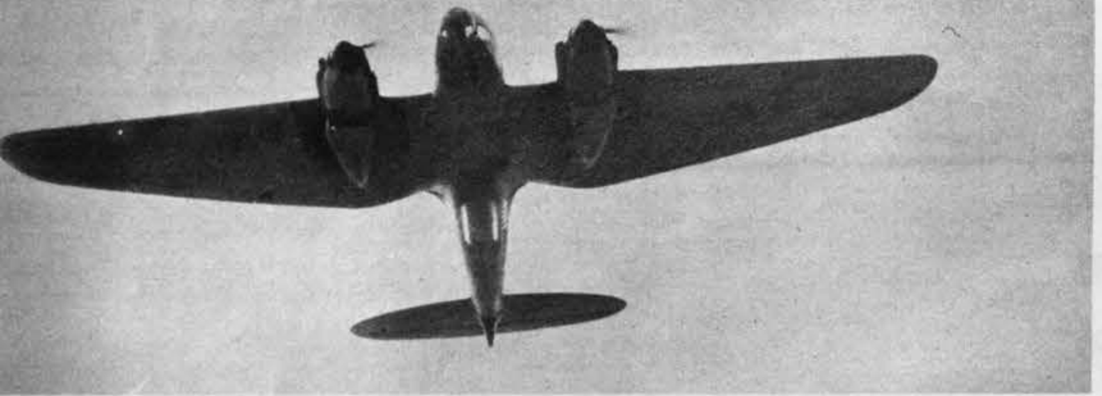
**Dornier bombers** have been one of the standbys of the Luftwaffe since the beginning—from the Do-17, the "Flying Pencil" of the first raids on London, to the latest Do-217M. Though German bombing has been much reduced in the west, the Do-217 is still a very important plane. Do-217N has supplemented Messerschmitts and Ju-88's as a nightfighter, while the Do-217M is appearing in increasing numbers as an attack bomber.



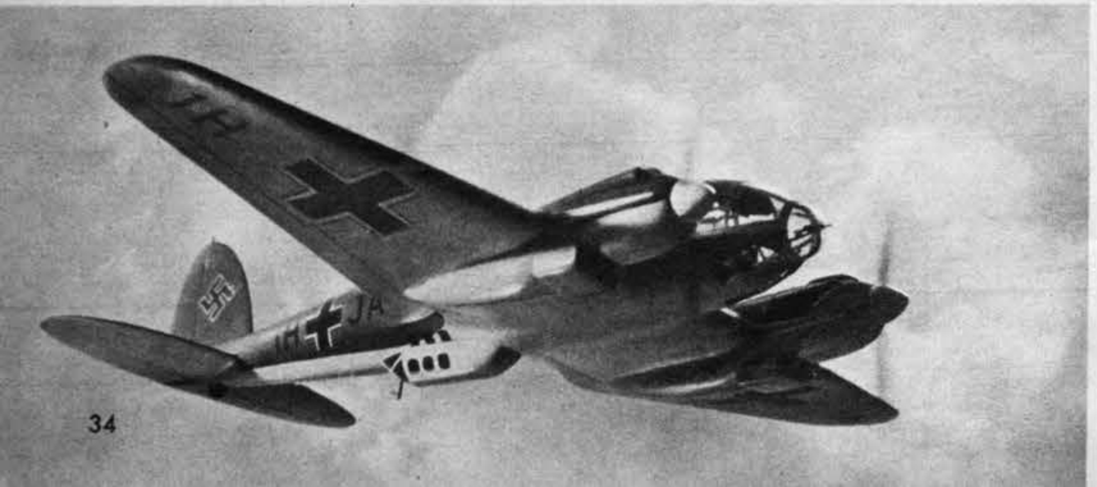
**Standard Do-217** until recently has been the E model shown above, one of whose prime recognition features is its blunt rounded wing. Now in operation is the Do-217M. This, along with E-5 and K subtypes, will soon be the most important operational versions. Pictures are not yet available, but intelligence sources indicate that the noses of the M-3 and M-8 are more streamlined, and that about 20 ft. have been added to the wingspan.

**The He-111** is obsolescent as a bomber with German air force but has appeared in Sicily and Italy as a paratroop carrier. In this activity it will be seen at low altitudes by ground troops. The tapered wing with cut-out at roots and elliptical stabilizer and elevators are good ground recognition points.

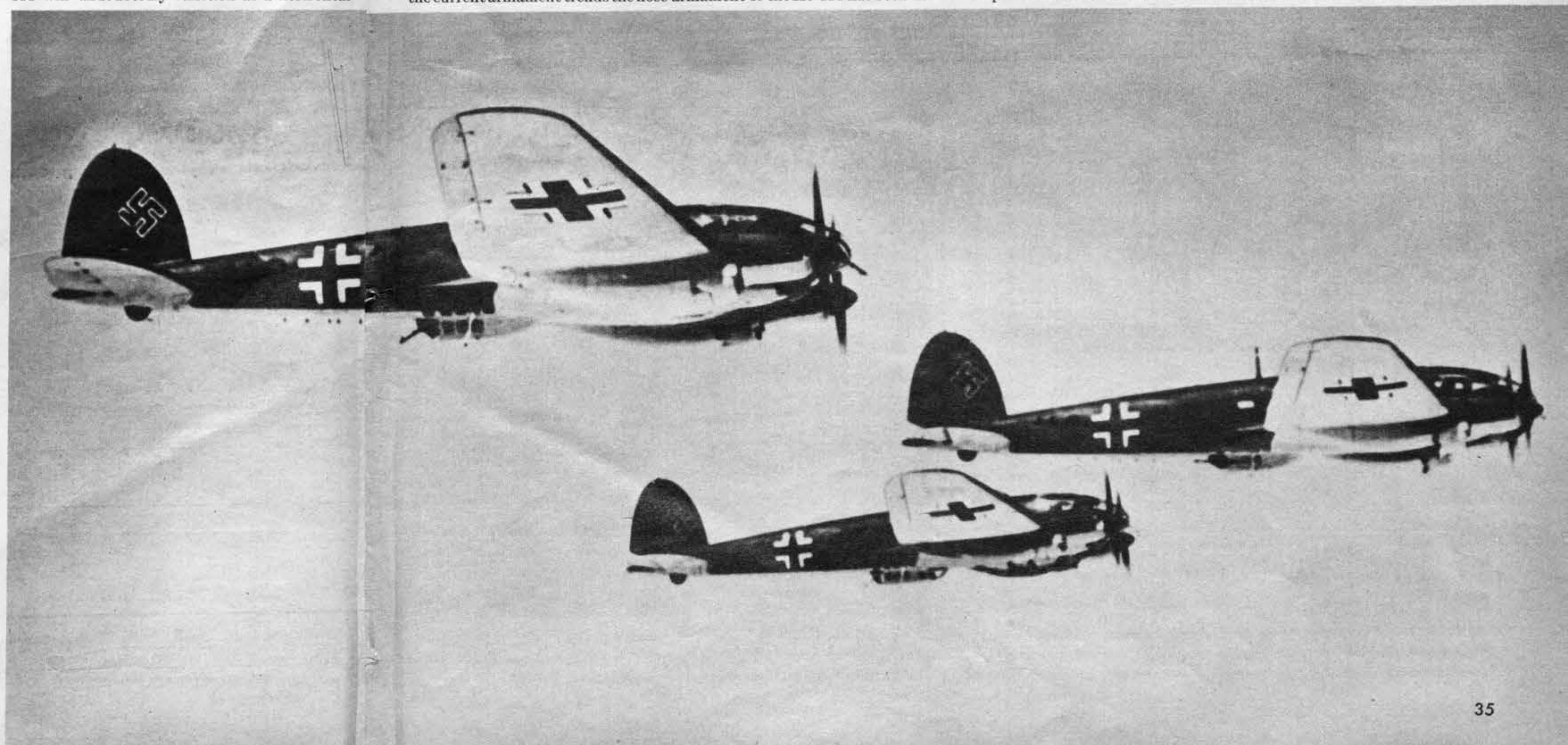
# HE-111

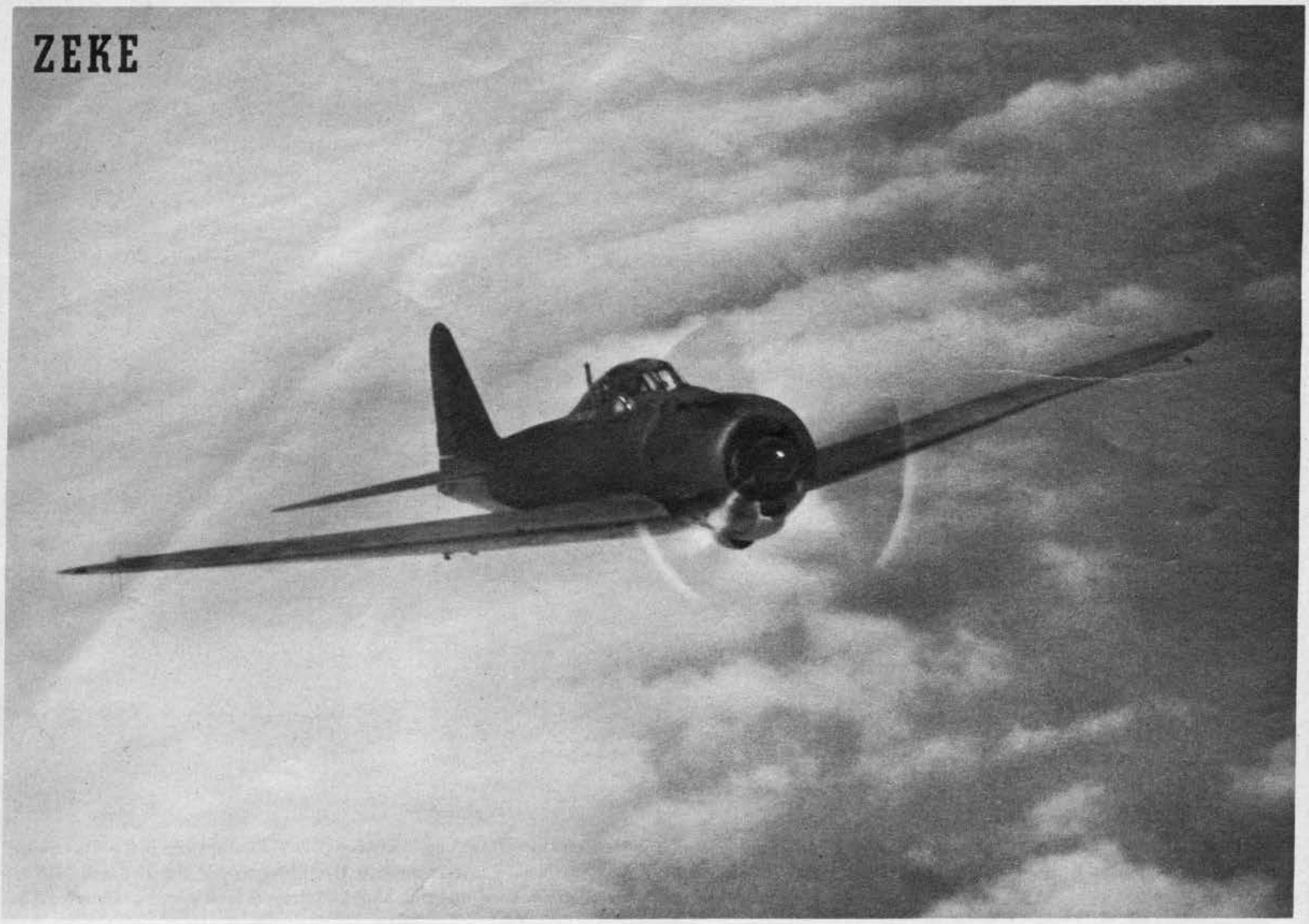


**Glider towing** is another low-level job for the He-111. This job is also performed by a strange plane, a Heinkel product, formed by joining the wings of two He-111's and mounting an additional engine at the juncture of the wings. Gliders are a favorite German method for transporting troops.



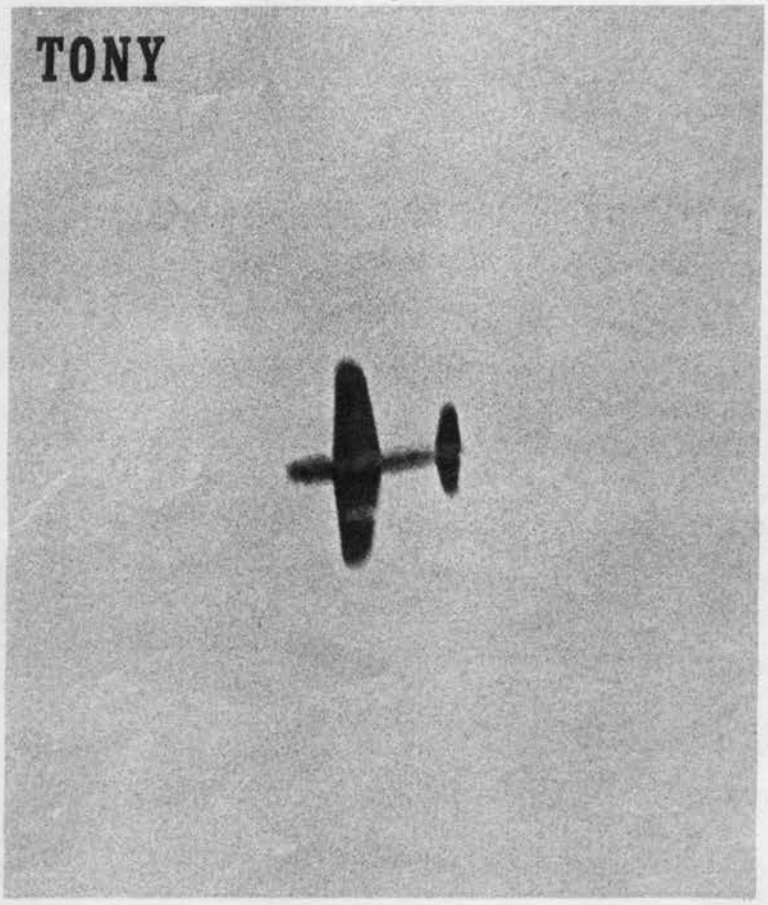
**In an all-out bombing,** such as would be attempted in large-scale action, the Nazis' Heinkel 111 will undoubtedly function as a horizontal bomber, attack bomber (perhaps even as a divebomber). It usually carries 4,410 lb. of bombs but can carry a maximum load of 6,600 lb. Following the current armament trends the nose armament of the He-111 has been increased to make it more effective against ground installations. Its claimed speed of 255 m.p.h. is low for ground-attack work, but its successes as a torpedo bomber indicate that it handles well in low-altitude operations.



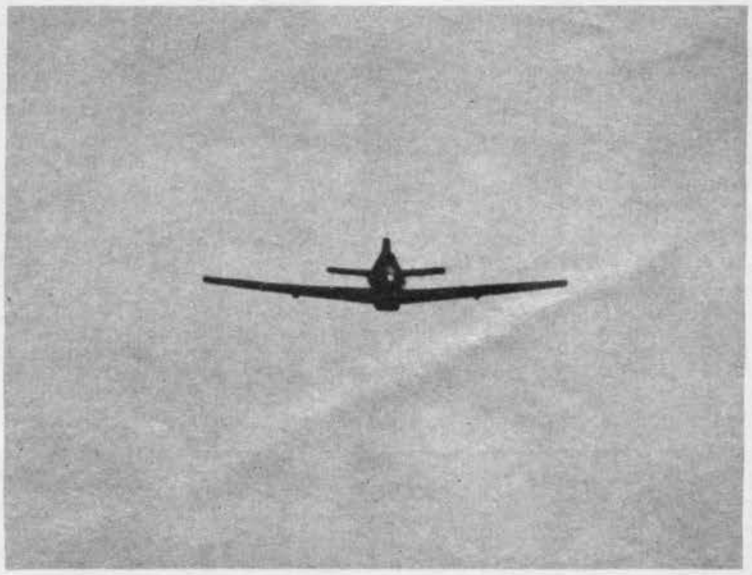


**The original "Zero,"** Zeke was the backbone of Japanese fighter strength at the time of the attack on Pearl Harbor. Though new fighter planes have appeared, it is still numerically the most important. It is unarmored and lacks self-sealing tanks, can outclimb and outmaneuver U.S. fighters in the Pacific theater. Some Zekes have both armor and increased firepower. Others encountered recently had two to four guns mounted in each wing.

# JAPS ARE GOOD AT LOW LEVELS

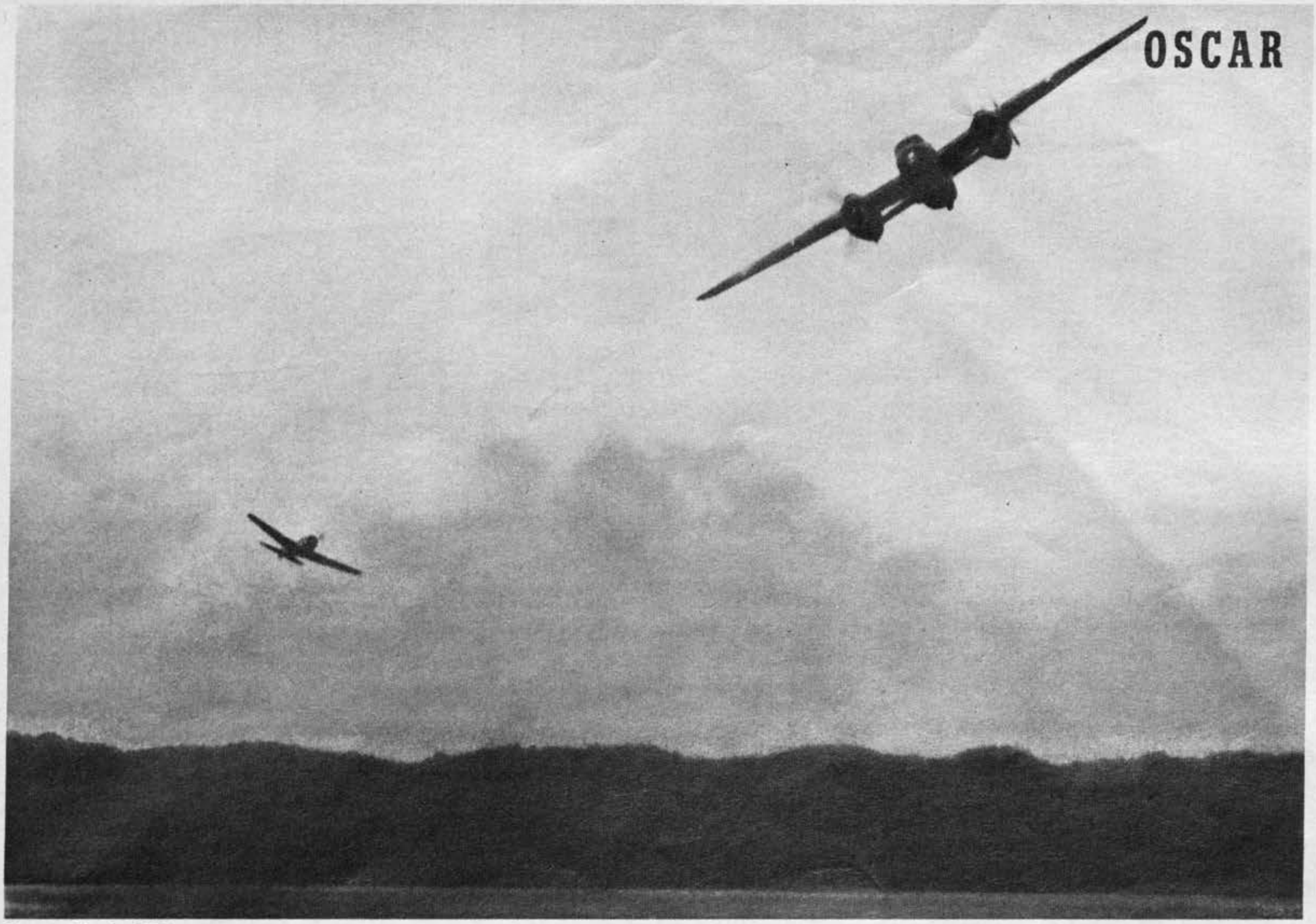


**Radical departure** in Japanese fighter design is the Army's fighter Tony. The first modern Jap fighter to use an inline engine, it was also the first found to contain built-in armor for the pilot. Other parts still remain unarmored.



**Tony carries bombs** on racks under each wing outboard of the landing gear. For long-range fighting, the bombs are replaced by extra fuel tanks and an additional jettisonable wooden tank is fitted beneath the fuselage.

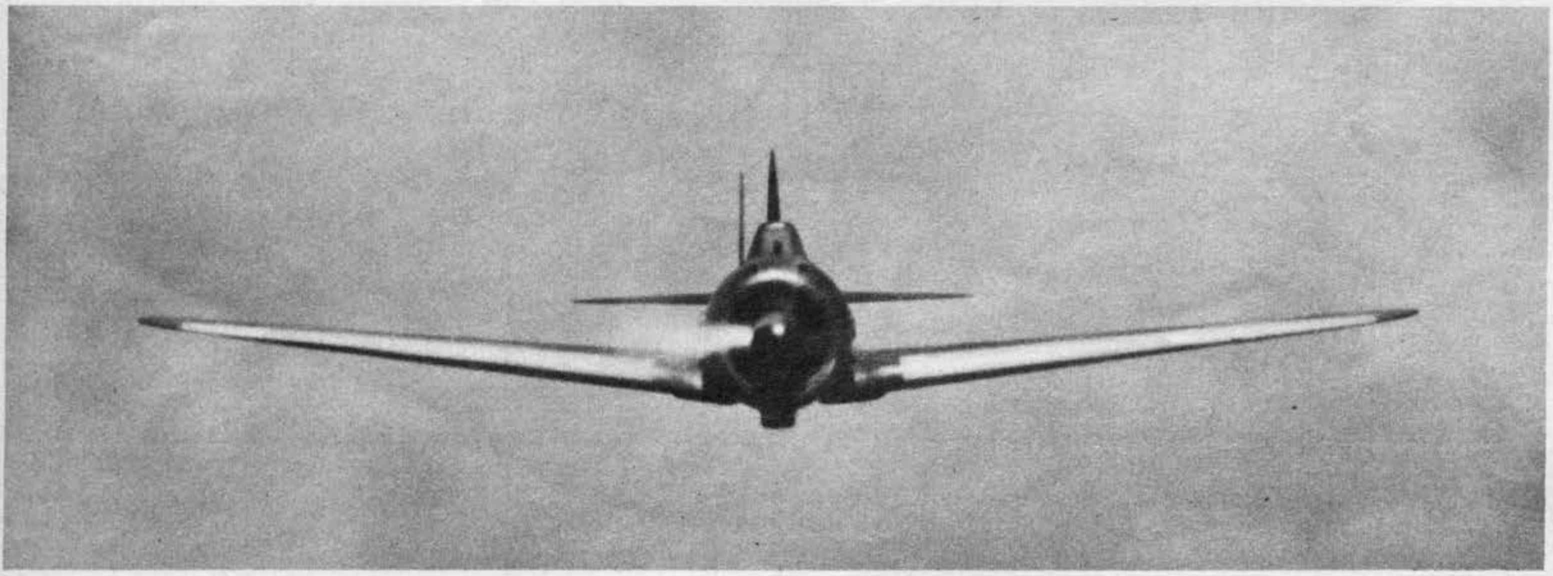
# OSCAR



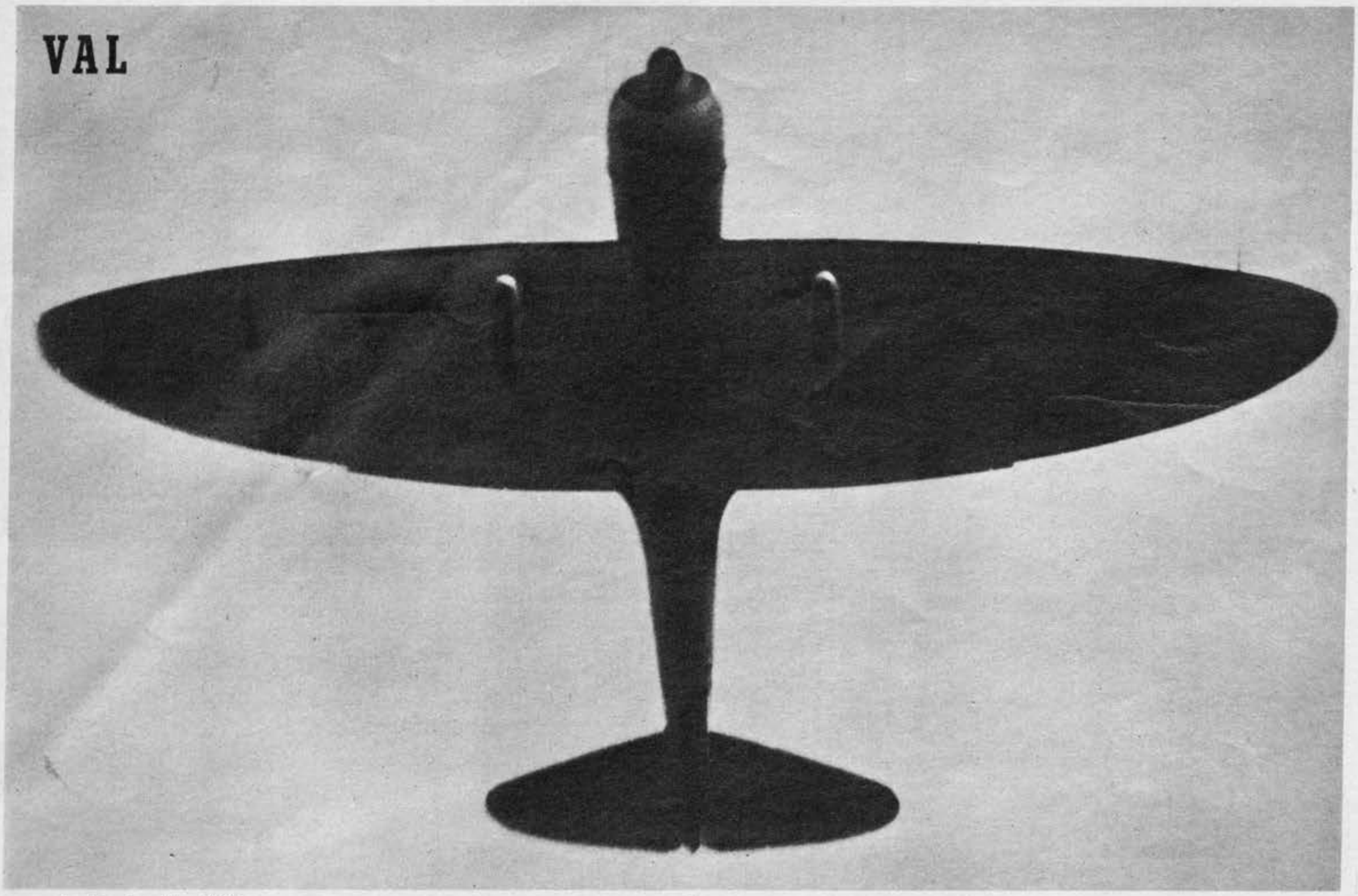
**Oscar attacks B-25** in this unique combat photograph. B-25's gunners succeeded in beating off the attacking Jap. Though damaged, both planes were able to make their home bases. Unlike Zeke and its clip-winged partner Hamp, Oscar is exclusively an Army plane. It first appeared in the Burma-India theater over a year ago and has chiefly been seen in areas controlled by land forces. It came into action in the Southwest Pacific during 1943.

From the beginning the Japanese have been very effective low-altitude attackers. In the naval war, their torpedo attacks have been pressed to very close ranges and their divebomber pilots have shown an almost complete disregard for their own lives. Strafing has also been a chief method of attack. Almost all bombing assaults have been preceded by a low-level spraying of machine-gun fire on our anti-aircraft installations so that dive and other bombers can loose their bombs with the greatest safety. In more recent days, however, Jap enthusiasm for charging into our fire has been somewhat dampened.

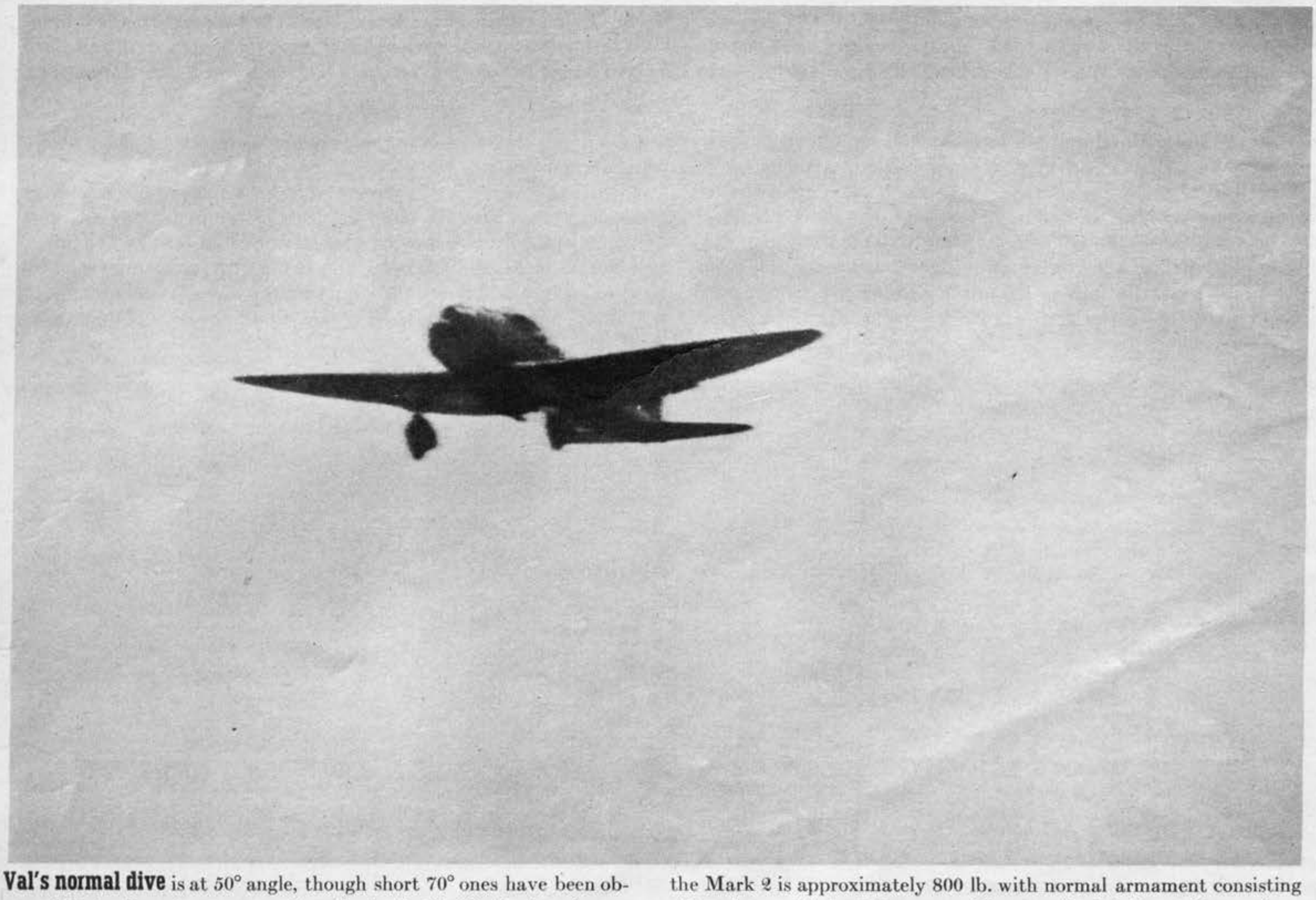
Now that we are able to mount superior airpower and a greater mass of ground fire, the older Jap tactics no longer pay off. But Japanese strategy is following the same line as that of the Allies and Germans. Most fighters are appearing with provisions for bomb carrying. More and more, the exigencies of war are bringing about a uniform pattern of low-level attack in all theaters of operation.



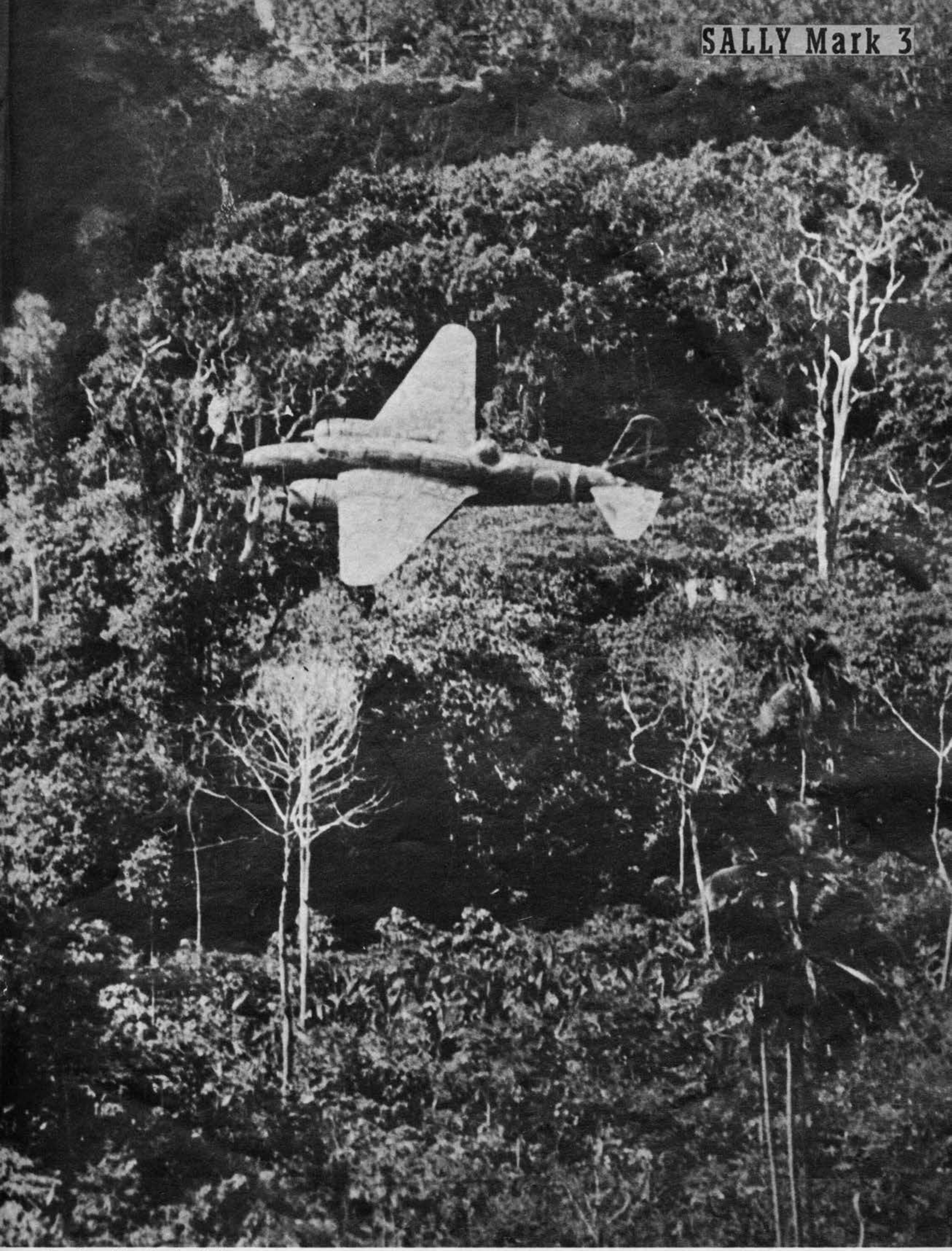
**Oscar,** like most Japanese fighters, is a very light and maneuverable plane. Compared to Allied and German planes it is extremely lightly armed, having only two 12.7-mm. machine guns in the nose firing through propeller arc. Oscar has some armor protection for the pilot and some fuel tank protection, but like most Japanese fighters, it will disintegrate under our heavy firepower. In appearance it somewhat resembles the Luftwaffe's FW-190.



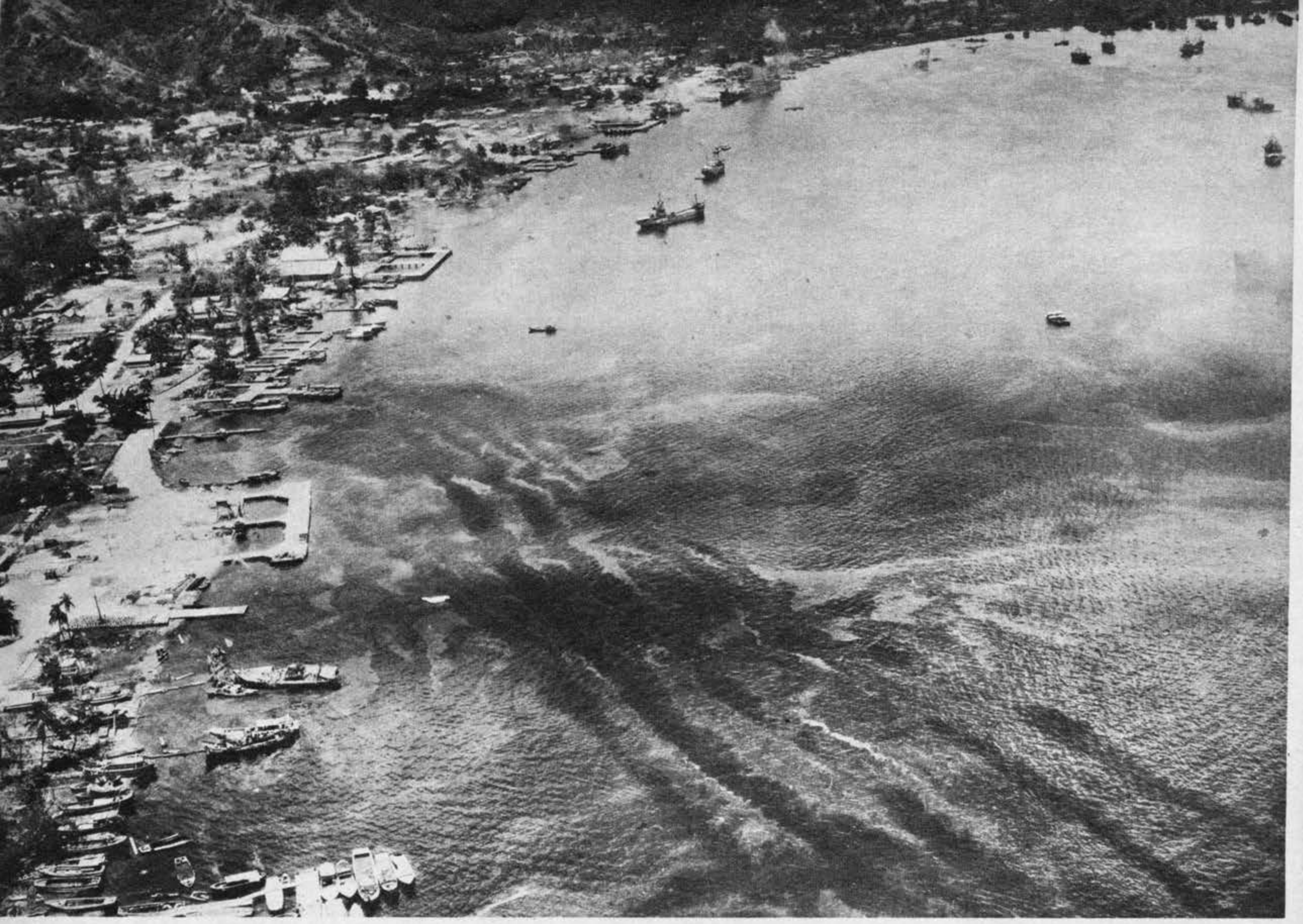
**Japan's divebomber Val** was built to operate from carriers and took part in the Pearl Harbor attack. Now flying from South Pacific island bases as well, it has been in action against U. S. ground installations. The outstanding recognition features from below are the elliptical wing, and fixed landing gear. The Vals pictured here are Mark 2's having larger spinners, more powerful engines and better streamlining than Mark 1's.



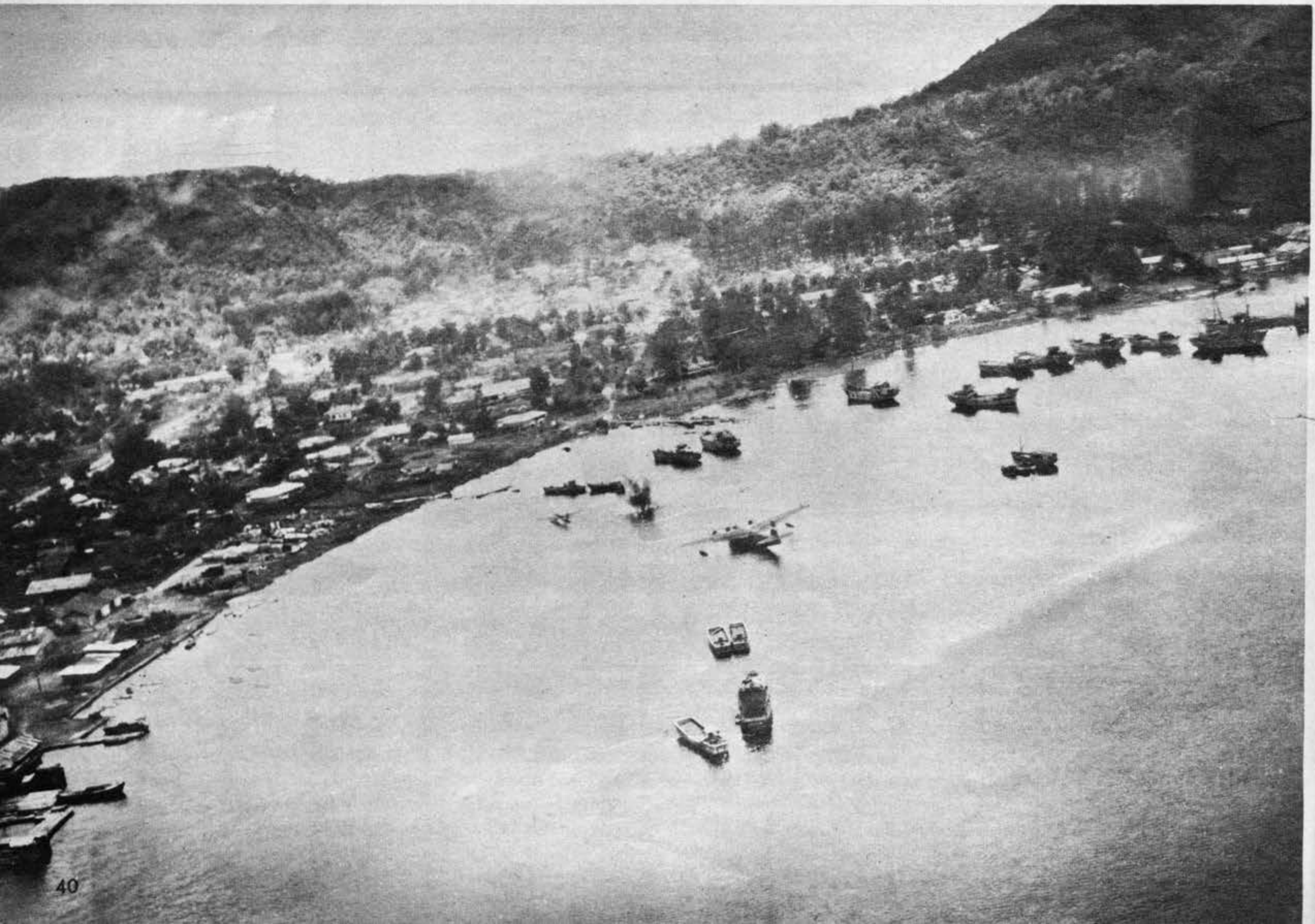
**Val's normal dive** is at 50° angle, though short 70° ones have been observed. It has been in every sea-air action in the Pacific theater of operations. Bomb releases below 700 ft. are common. Normal bomb load for the Mark 2 is approximately 800 lb. with normal armament consisting of two forward-firing 7.7-mm. machine guns fixed in the engine cowling, one 7.7 in observer's cockpit. Val's span is 47 ft. 6 in.; length is 33 ft.

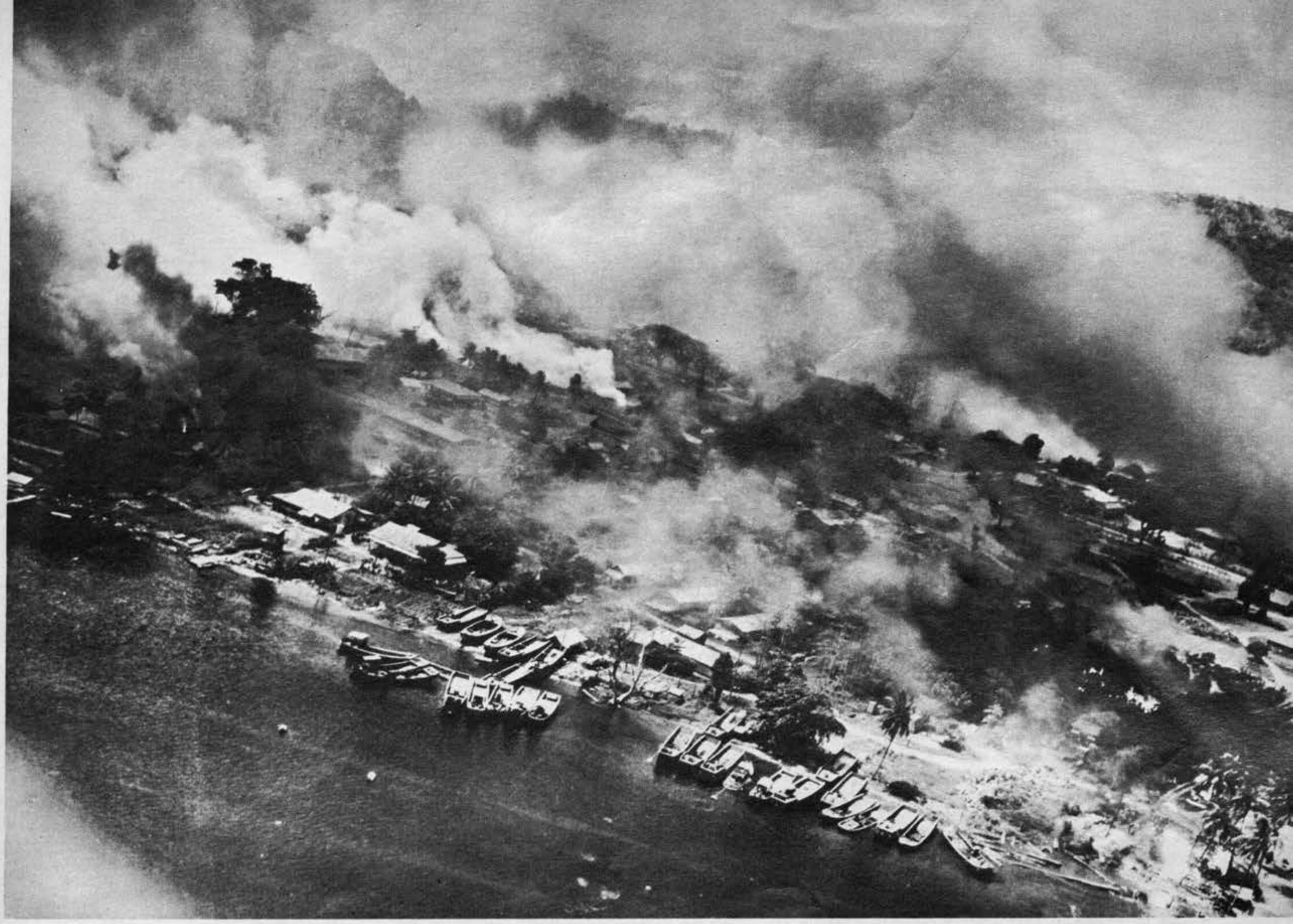


**Army's medium bomber Sally** springs from 1937 design and has been changed considerably in the course of developing Mark 3 (*above*). Photographed and later shot down by the crew of a B-25, this Sally Mark 3 has dorsal turret with single 12.7-mm. machine gun. Though reports of additional armament vary, Sally is known to have tail stinger as well as guns in nose, belly and sides. Length is 52 ft.; wingspread, 74 ft. 8 in.



**SWOOPING OVER RABAUL** at 100 ft., photographer in B-25 snapped above picture, then went on to take shot printed below. Several types of landing barges are seen in the left foreground (*above*). Fragmentation bomb (*below*) has struck between planes Emily and Jake, while parabombs cover shore.





**RABAUL BLAZES FIERCELY** after an attack by U. S. B-25's. Predominant in the barge concentration tied up along waterfront are several Army Type A landing craft. Over 200 tons of war matériel can be carried by the barges shown above. These barges also move personnel in addition to supplies.

# JAPANESE BARGES

## Still a potent threat, enemy's landing equipment mainly reinforces battered transport fleet

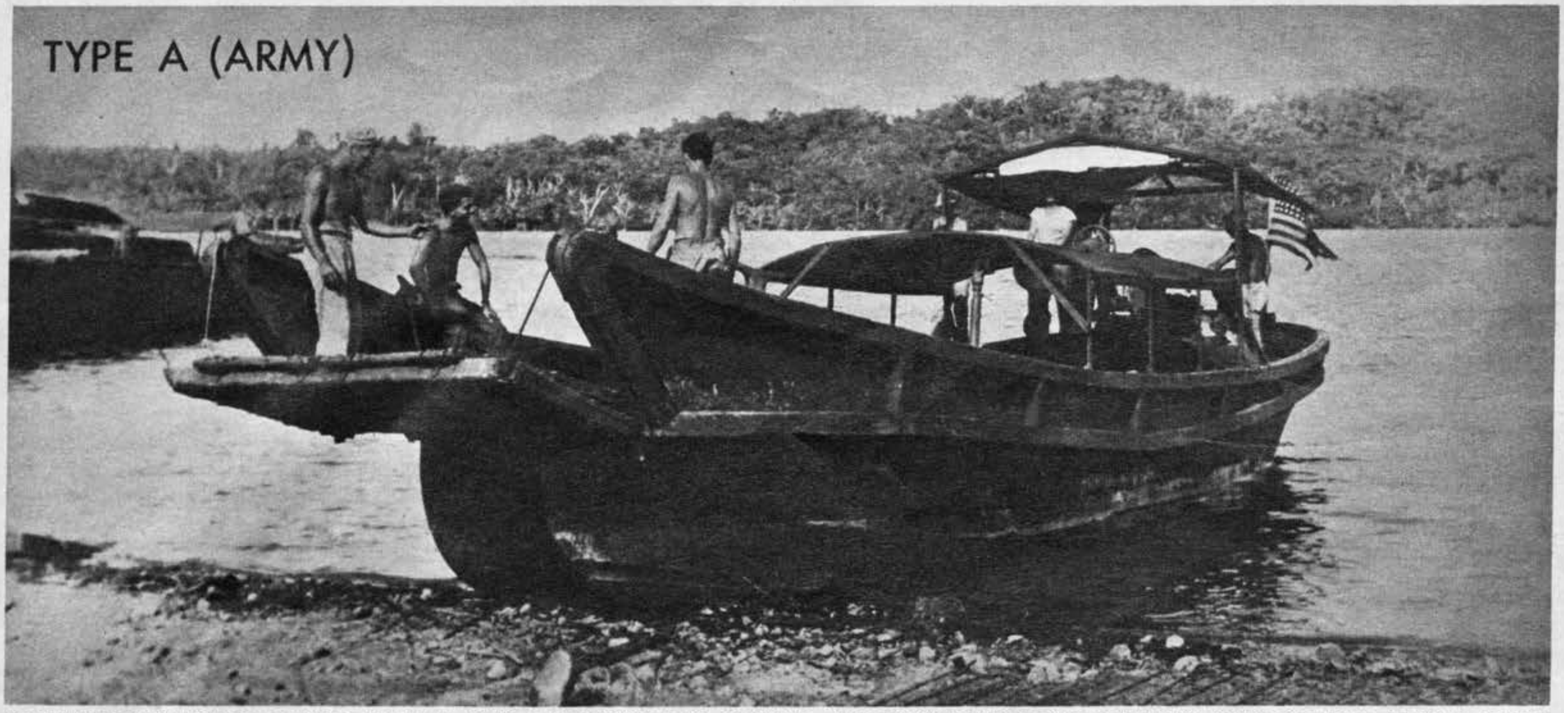
No longer able to muster overwhelming sea and air might, backbone of their landing operations in 1941–42, the Japanese have, nevertheless, retained barges as an integral part of their South Pacific operations. Recently, reports of U. S. aerial activity over New Guinea and the smaller islands have included more and more mentions of smashing barge concentrations, while PT boats have been taking an increasing toll of similar targets. Though coordinated assaults by huge task forces are not likely to be repeated by the Japanese, they may attempt to forestall the Allied advance with diversionary stabs at shore positions.

But more important than this threat is the fact that barge fleets have turned out to be fine substitutes for cargo vessels and transports, particularly since some sea lanes have been so badly slashed by U. S. airpower. To cut down barge losses the Japanese have set up an ingenious short-hop water route. Each leg of the trip, from staging point to staging point, takes a night's sail. The barges usually operate in shallow reef-infested waters inaccessible to U. S. destroyers and PT boats. During the day they remain in hiding, concealed under overhanging trees or are camouflaged on open beaches.

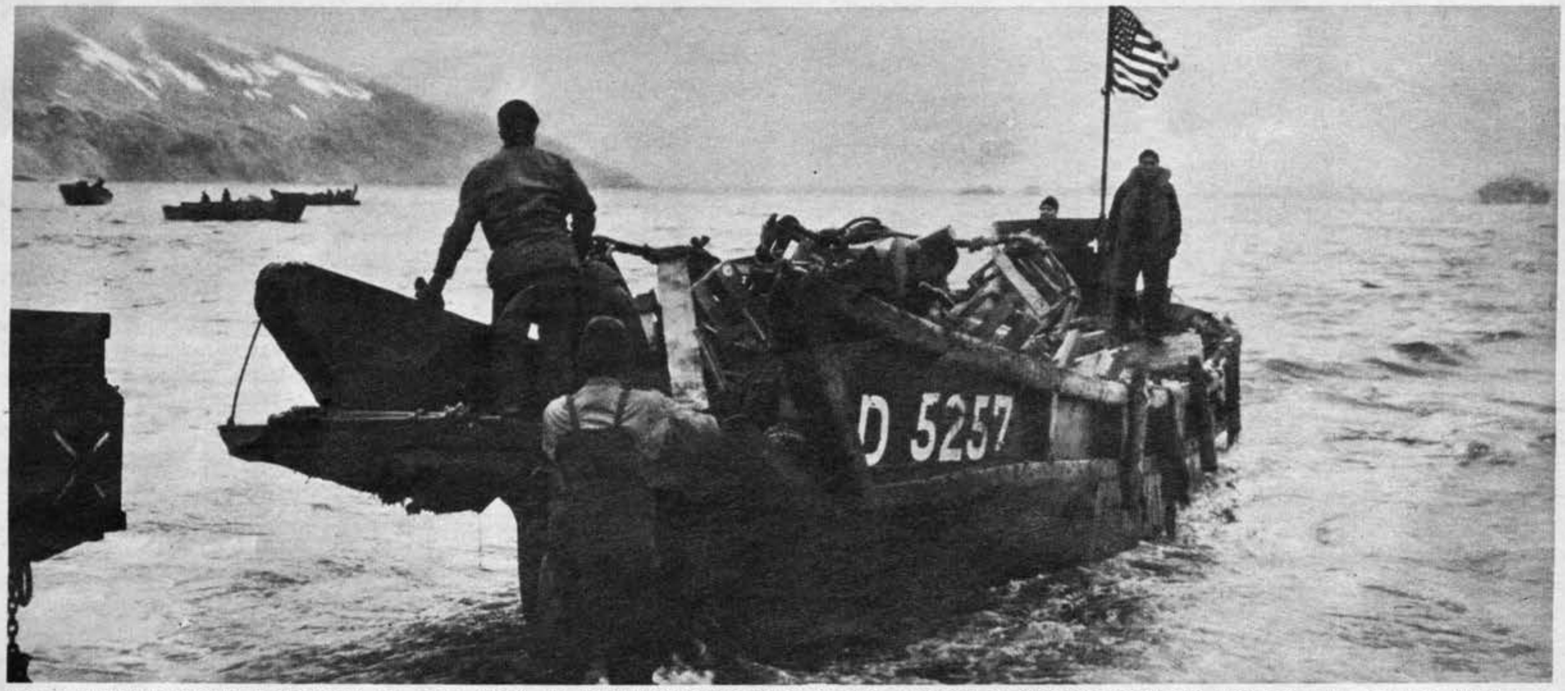
Since 13 Type A barges, each carrying ten tons of supplies, can maintain 20,000 men for a day, the tremendous value of the Japanese barges becomes apparent. Low-altitude air attacks by U. S. fliers have been daring and have not depended on previous briefing when targets are visible, ammunition available. However, spotting barge concentrations and staging points from the air and strafing them or planting bombs right on the barges (skip-bombing does not work against their low hulls) will hurt more than indiscriminate shooting up of all enemy surface craft.

The Japanese landing craft fleet is based on some nine types of barges. They range in length from 55½ ft. for the airscrew-powered Type E (*pp. 46–47*) to 15 ft. for the collapsible unit (*p. 47*). There is no evidence of a Japanese counterpart to our big LCT's and LCI's (*see Journal, Feb. 1944*). With ground forces less mechanized than ours, there was no need for the Japanese to design specialized craft to bring big tanks, trucks, jeeps ashore. The emphasis is on men, on defensive armor and on firepower. Even Type C (*p. 45*), the type corresponding most closely to the U. S. Landing Craft, Support, can carry 50 men.

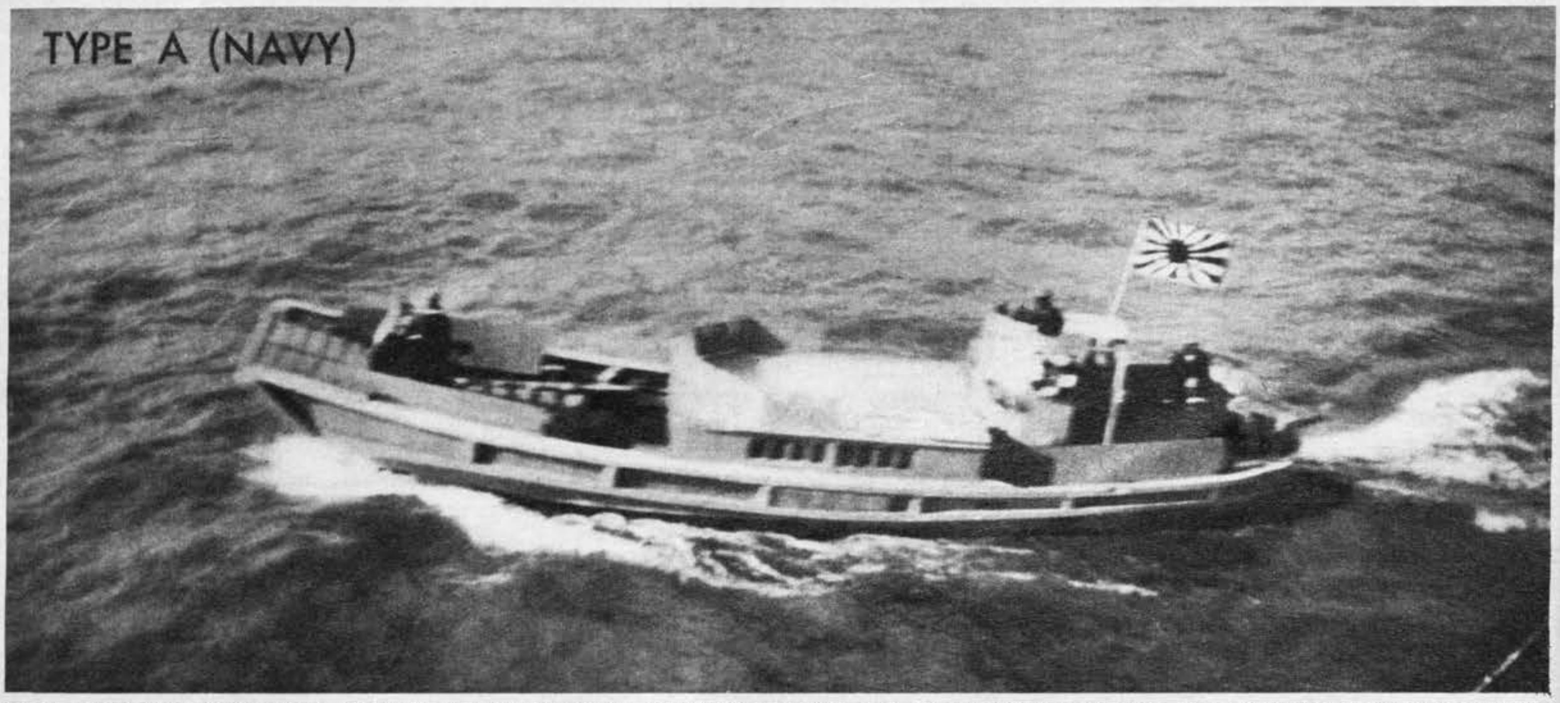
Taken at Rabaul, the pictures on these pages show how Japanese barge concentrations appear from the air. Evidently not primary targets in the raid depicted here, they do, nevertheless, come in for intensive punishment on other missions. On the following pages are shown the major types of Japanese landing craft. Additional information on the subject is available in ONI Manual 225J.



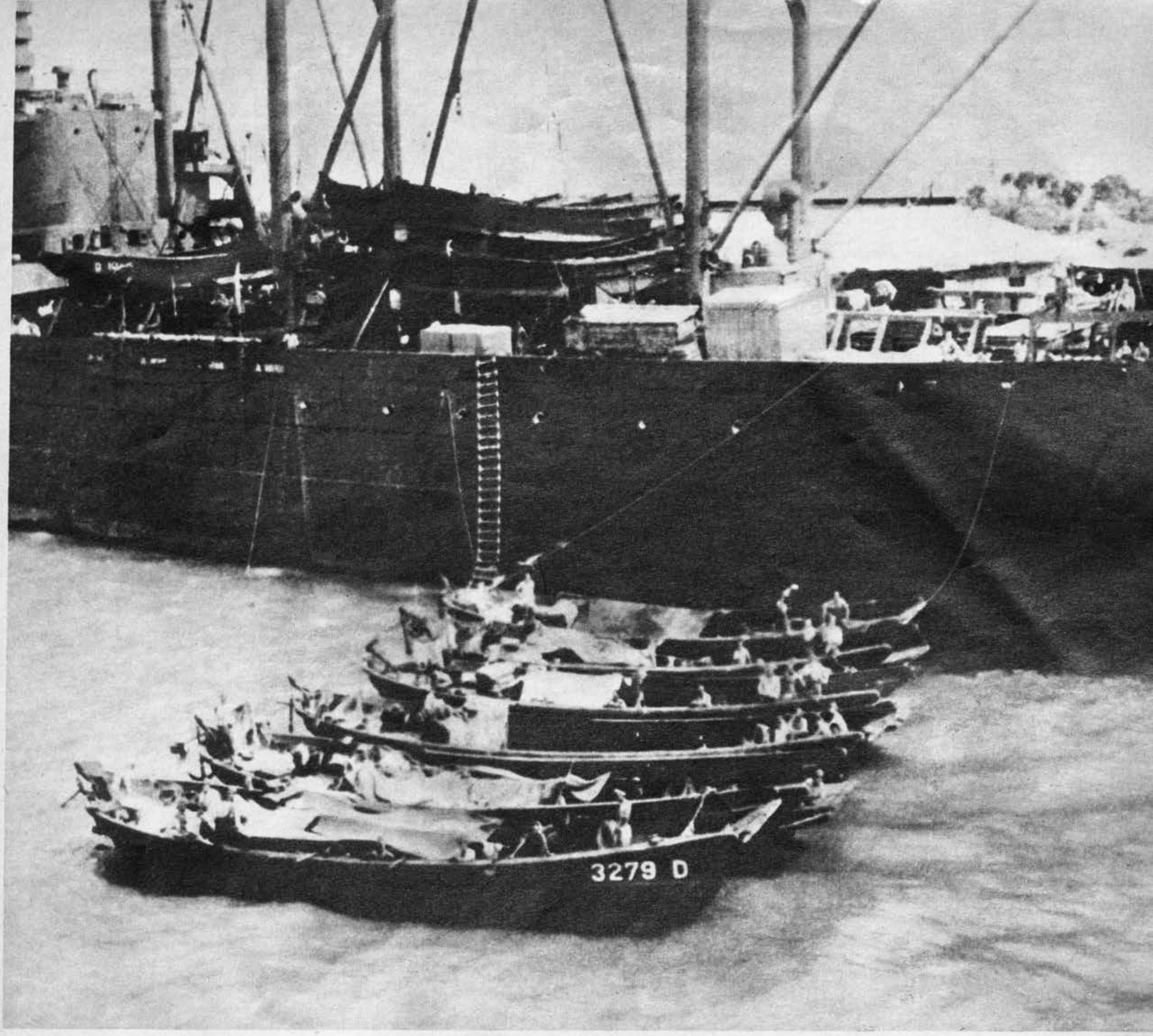
MOST IMPORTANT JAPANESE LANDING CRAFT ARE ARMY AND NAVY TYPE A'S. CAPTURED ARMY UNIT (ABOVE) SHOWS HOW TWIN KEELS GIVE CRAFT STABILITY ASHORE



TYPE A (ARMY) HAS SAME LENGTH (49 FT.), BEAM (11½ FT.) AS NAVY COUNTERPART BELOW. LACKING DECKHOUSE IT CARRIES 100–120 MEN AGAINST NAVY'S 60

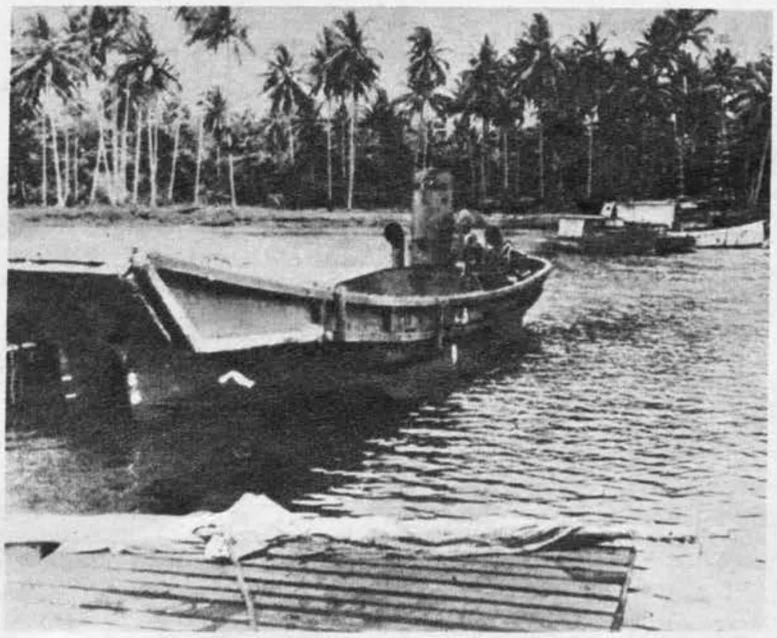


TYPE A (NAVY) MAY MOUNT 20-MM. OERLIKON-TYPE MACHINE GUNS. BULWARKS FORWARD, SHIELDS AFT PROTECT PERSONNEL. NOTE GUNWALE'S PRONOUNCED SHEER



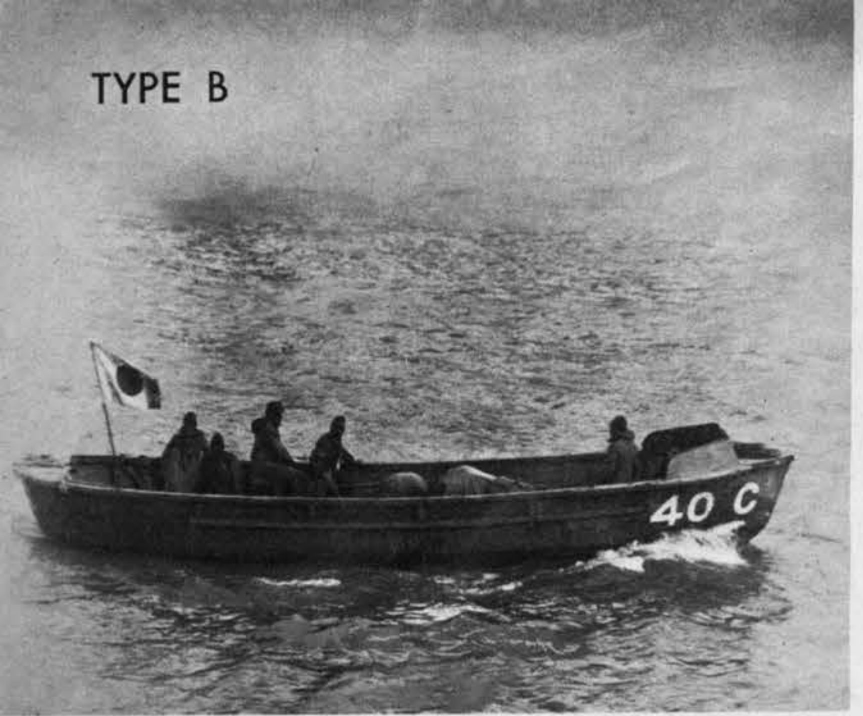
**ARMY TYPE A'S** are shown lined up alongside a large transport vessel off Indo-China in August, 1941, when Japanese took control of French colony in Far East. Called Daihatsu by the Japanese, it is identified as "large landing barge" by U. S. forces in South Pacific. The Type A is an adaptation of a fishing boat design. It has a metal hull, wooden bow ramp. Two-cylinder gasoline engine or 6-cylinder Diesel gives it speed of 8–10 knots.

**ABANDONED IN SOLOMONS,** Type A (Army) barges, show characteristic sheer of gunwales, sharply raked bow. Despite frail appearance, Type A can transport 7-ton tanks, 155-mm. howitzer, large complement of troops.

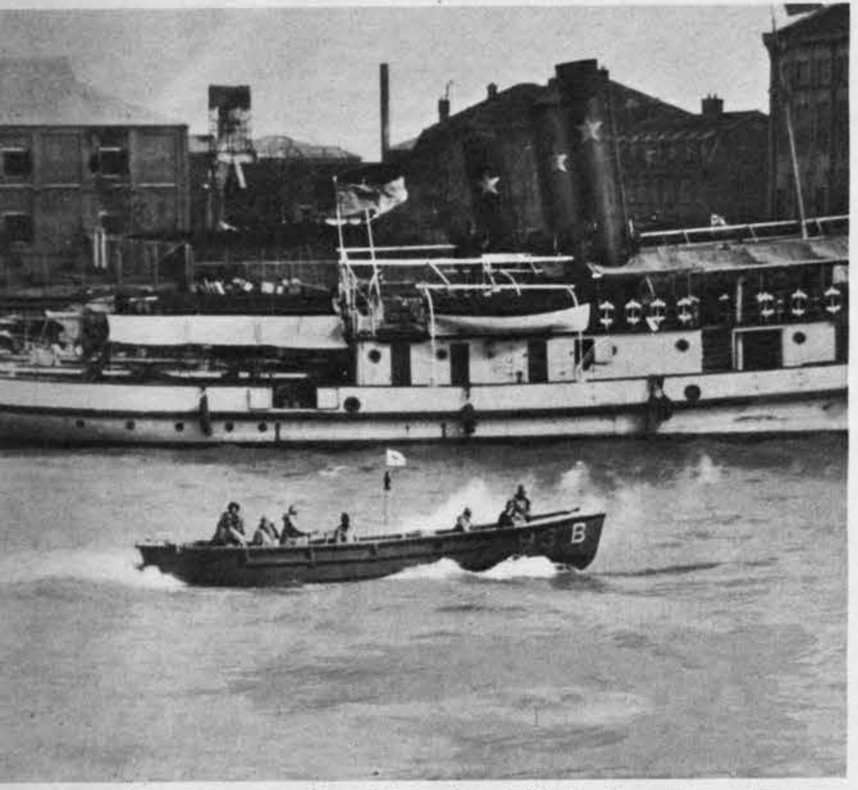


**TWIN KEEL OF TYPE A** is visible under the bow of captured barge. Bulkhead is about three-fourths of the way aft from bow. With flap ramp and large capacity, Type A is the craft most likely to be used against open beaches.

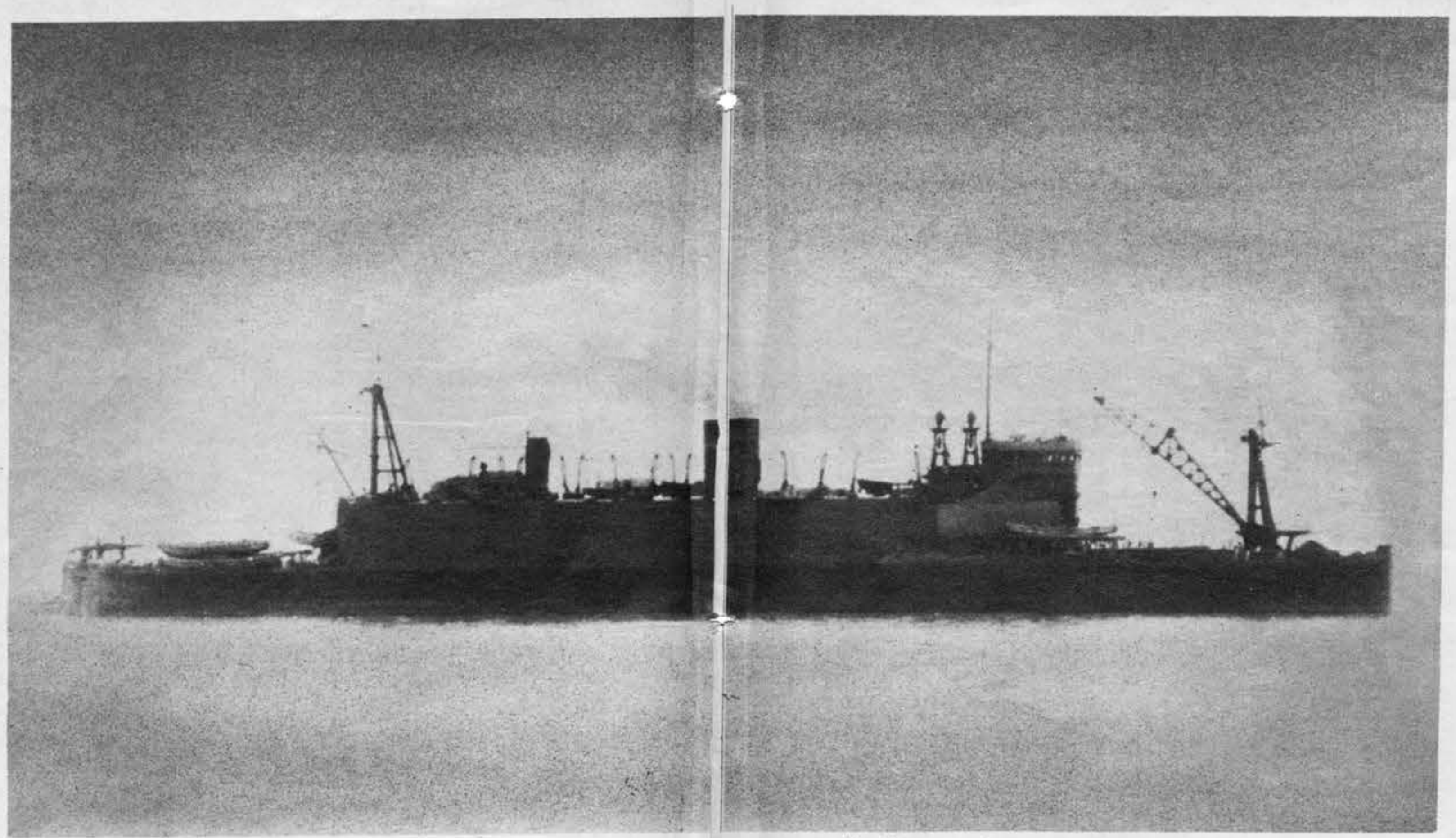
## TYPE B



**TYPE B LANDING CRAFT** is one of the smallest Japanese barges, having an overall length of 30 ft., beam 7½ ft. Capacity is 40 men, speed is 8–10 knots.

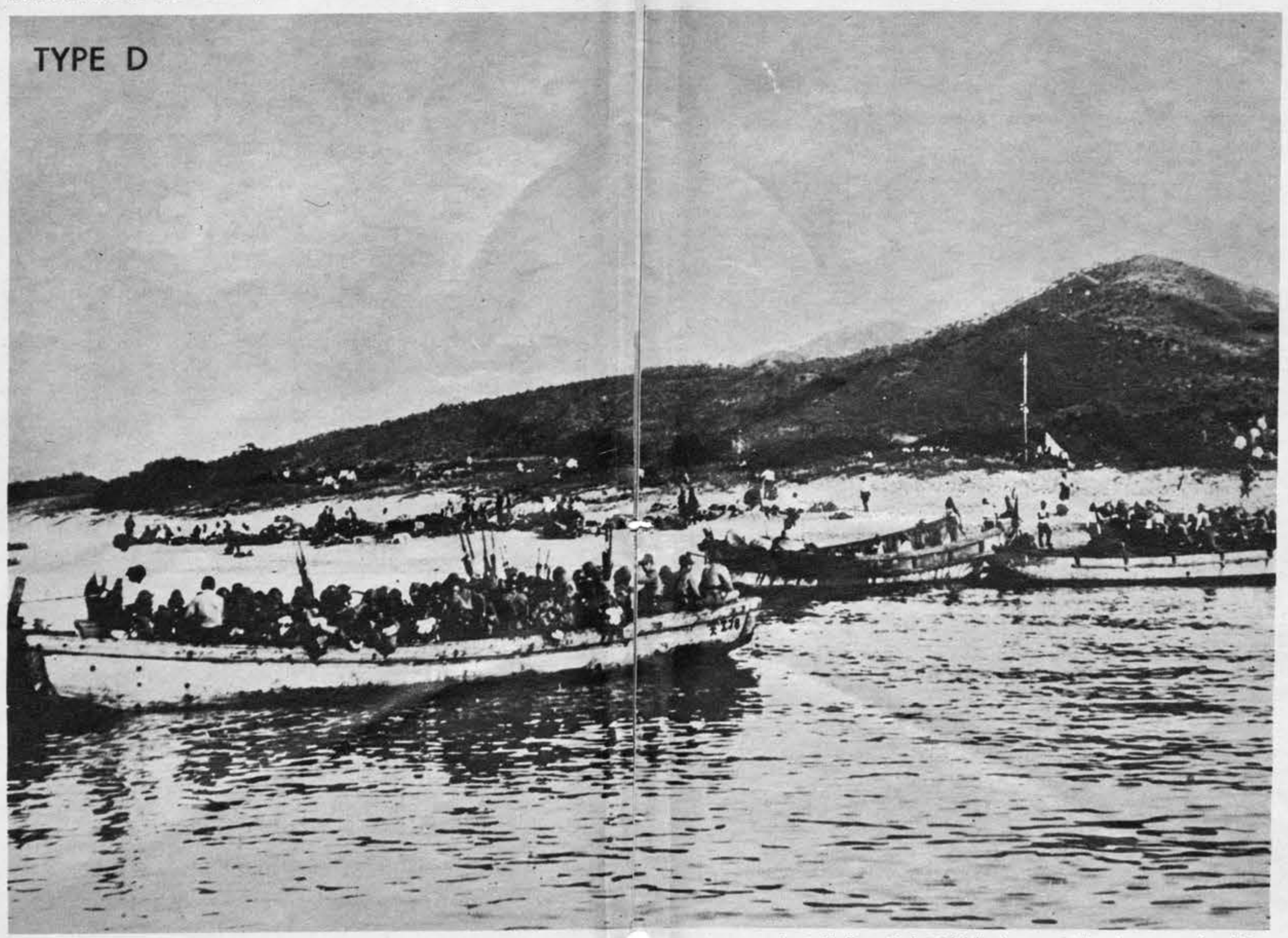


**ARMORED AND ARMED,** Type B is used for initial landings. It resembles merchant lifeboats. Unit below is disembarking Japanese troops near Shanghai.



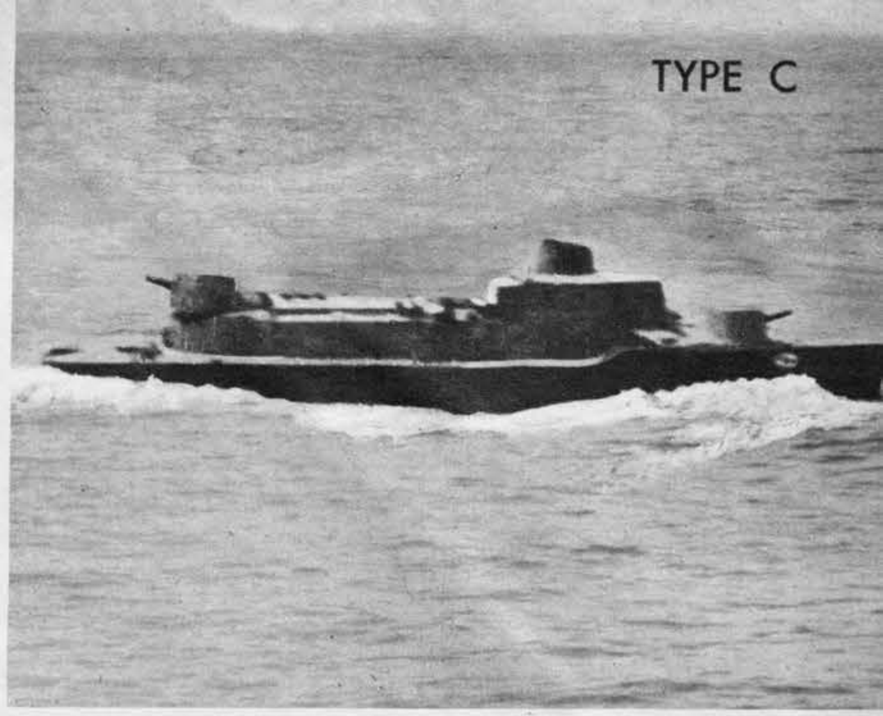
**LANDING CRAFT CARRIER** is used to discharge landing craft during amphibious attack. The 7,500-ton ship serves as a floating supply base in support of landing operations. This landing craft carrier is 367 ft. in length, 50–55 ft. wide, can carry 24 large craft, 120 small ones, up to 6,620 men.

## TYPE D

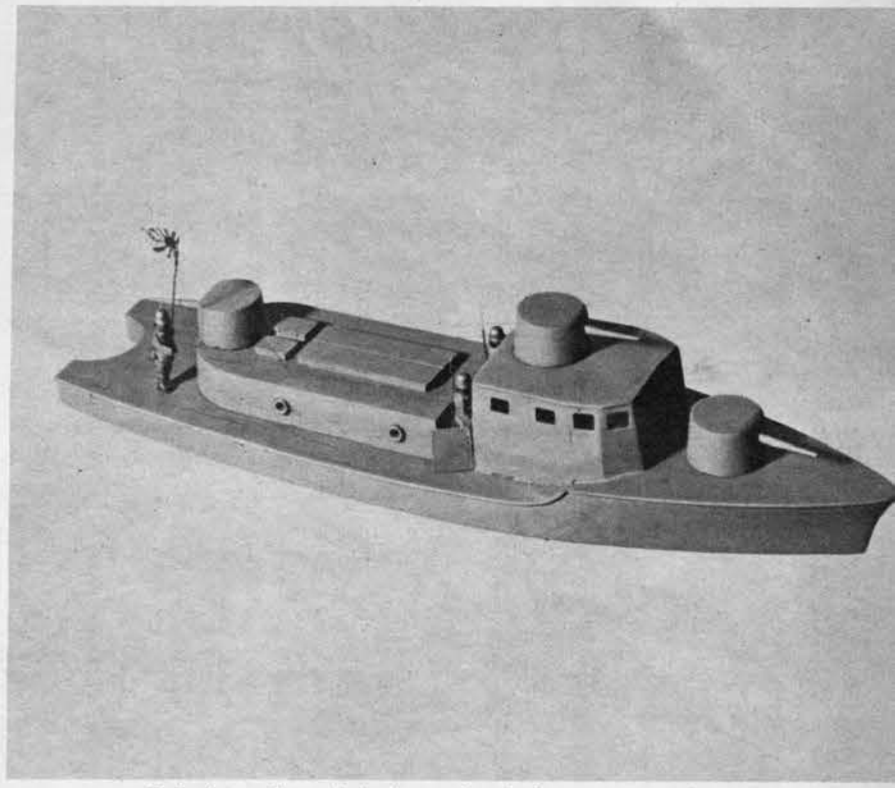


**JAMMED WITH TROOPS,** Type D barges run ashore in seaborne assault. Able to carry 60 men, some of them are powered with gas engines, others are not powered at all. Length is 38½ ft., beam, 11 ft.; bow may be either clipper or sampan type. The barge resembles U. S. M. C. artillery lighter.

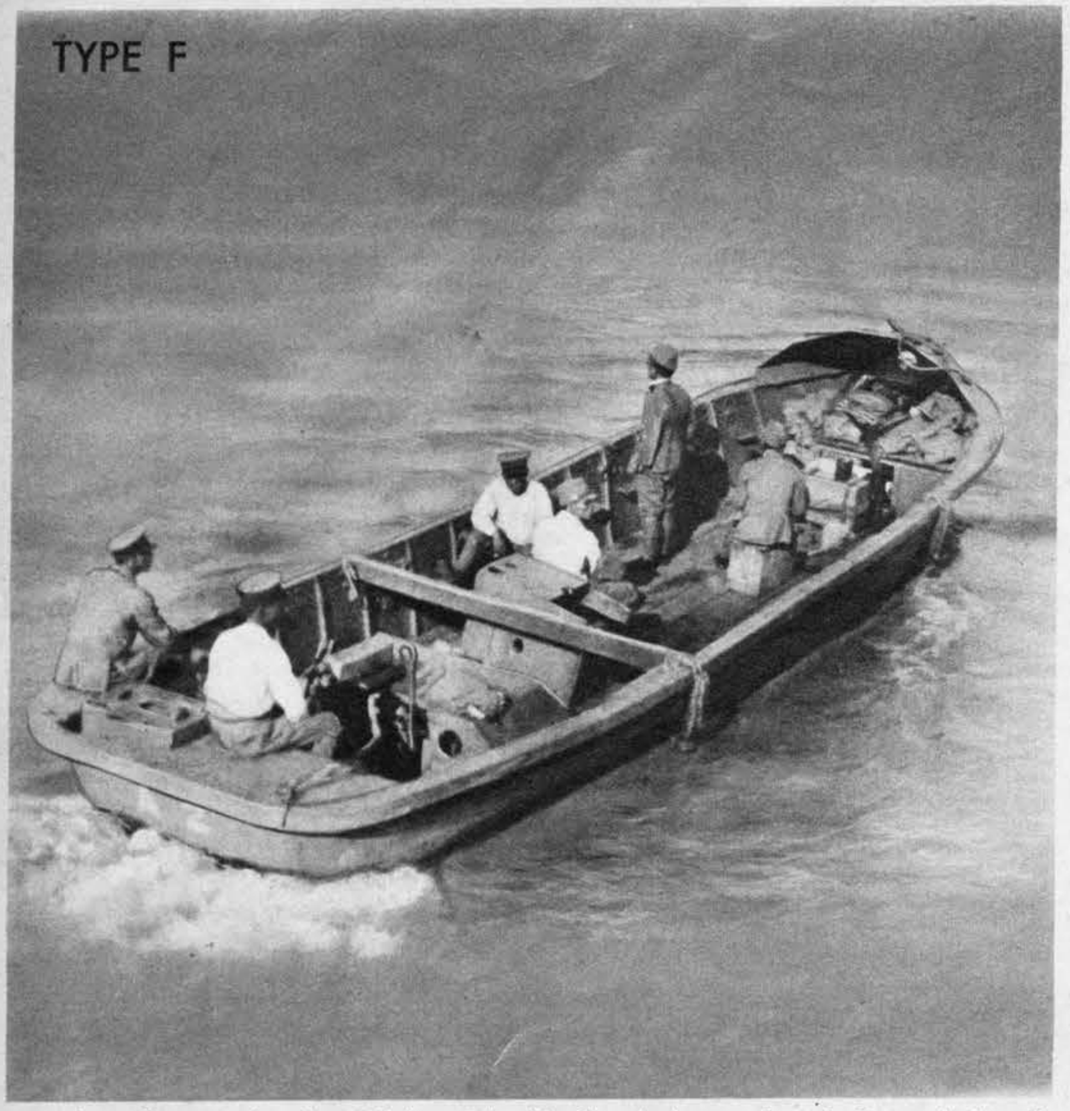
## TYPE C



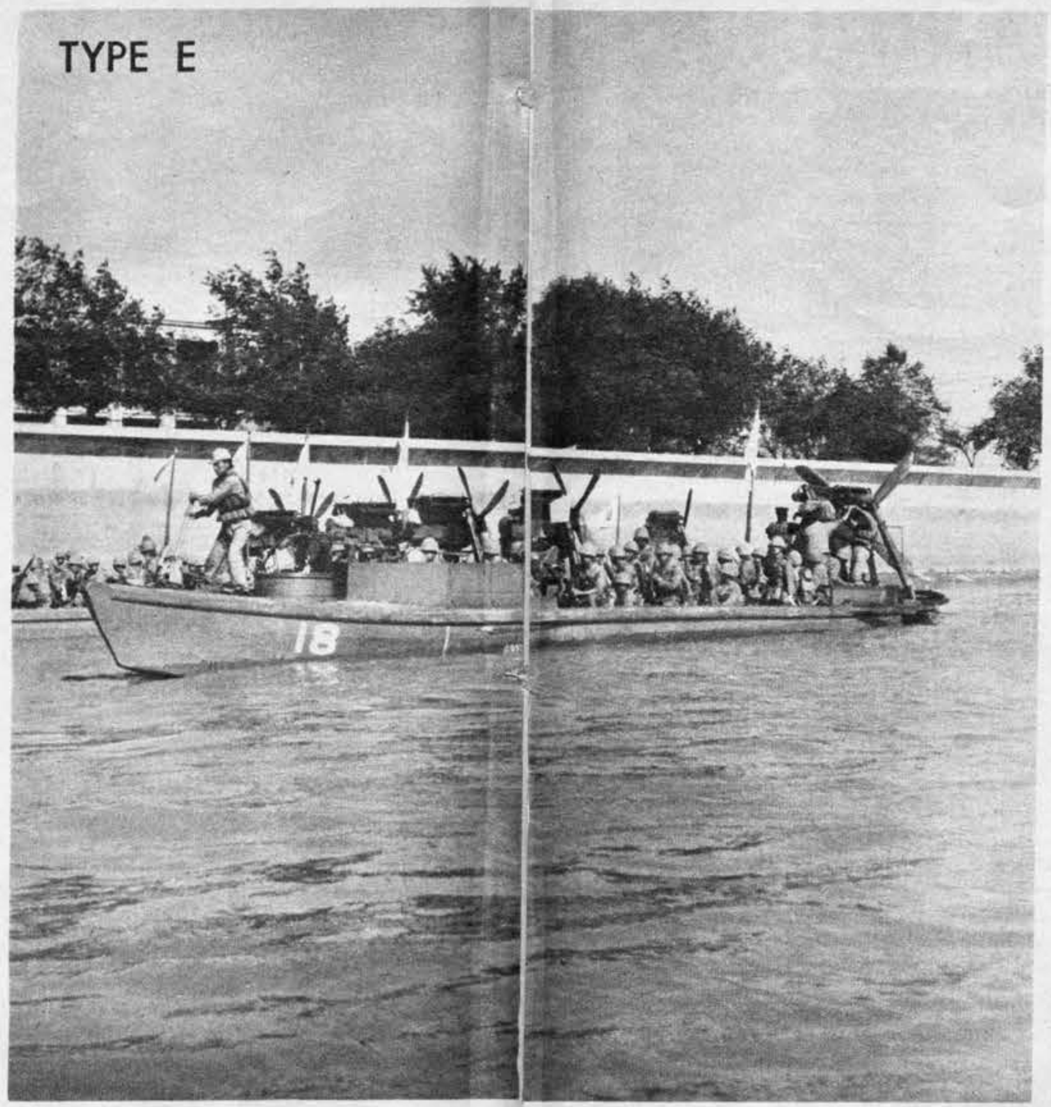
**SPEEDY DIESEL-POWERED** Type C (*above and below*) supports landing operations, patrols in addition to landing troops. Its length is 49 ft., speed 25 knots.



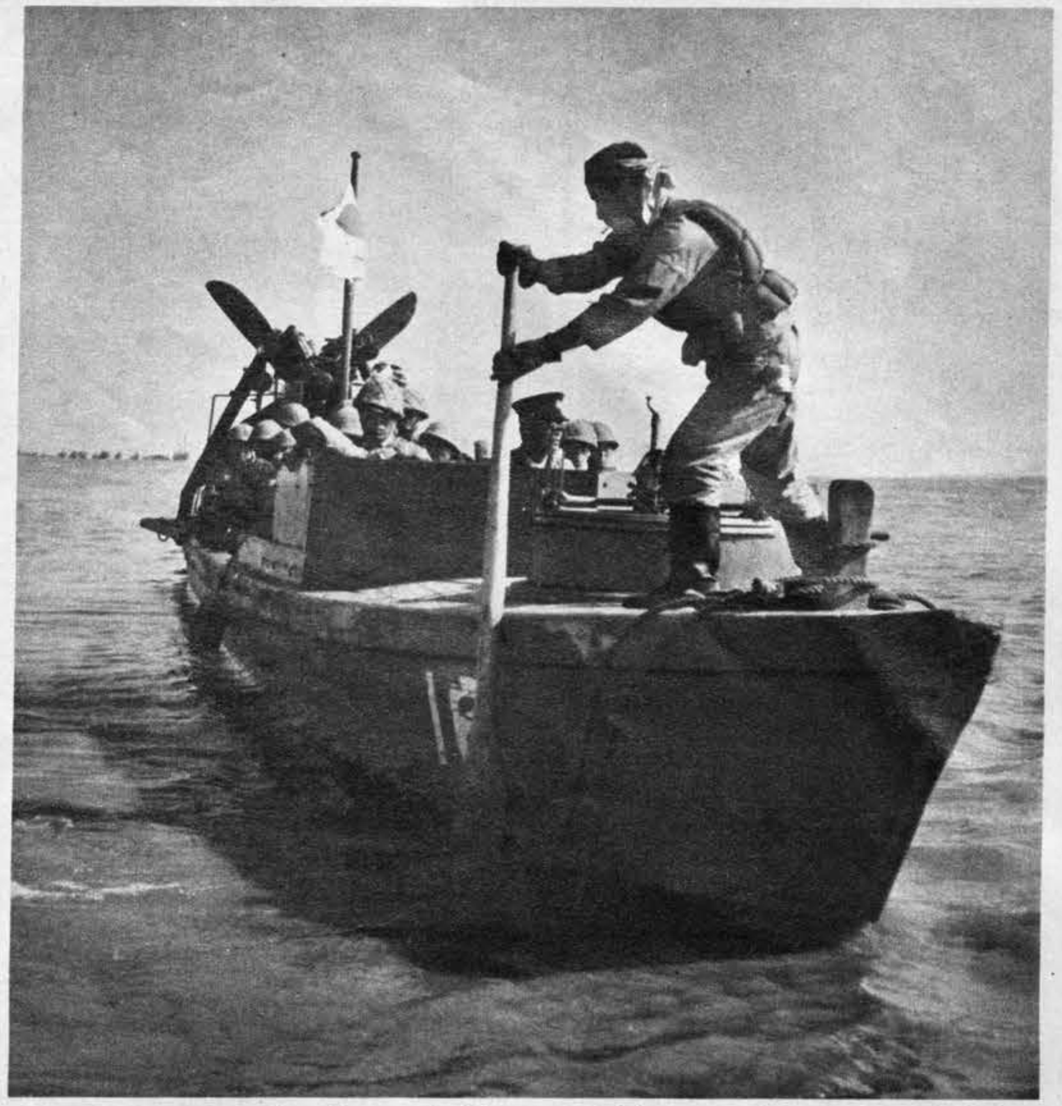
**TYPE D CRAFT** (*below*) are shown lashed together, being towed. Ship in background is either Idumo or Iwate, ships used for training or coast defense.



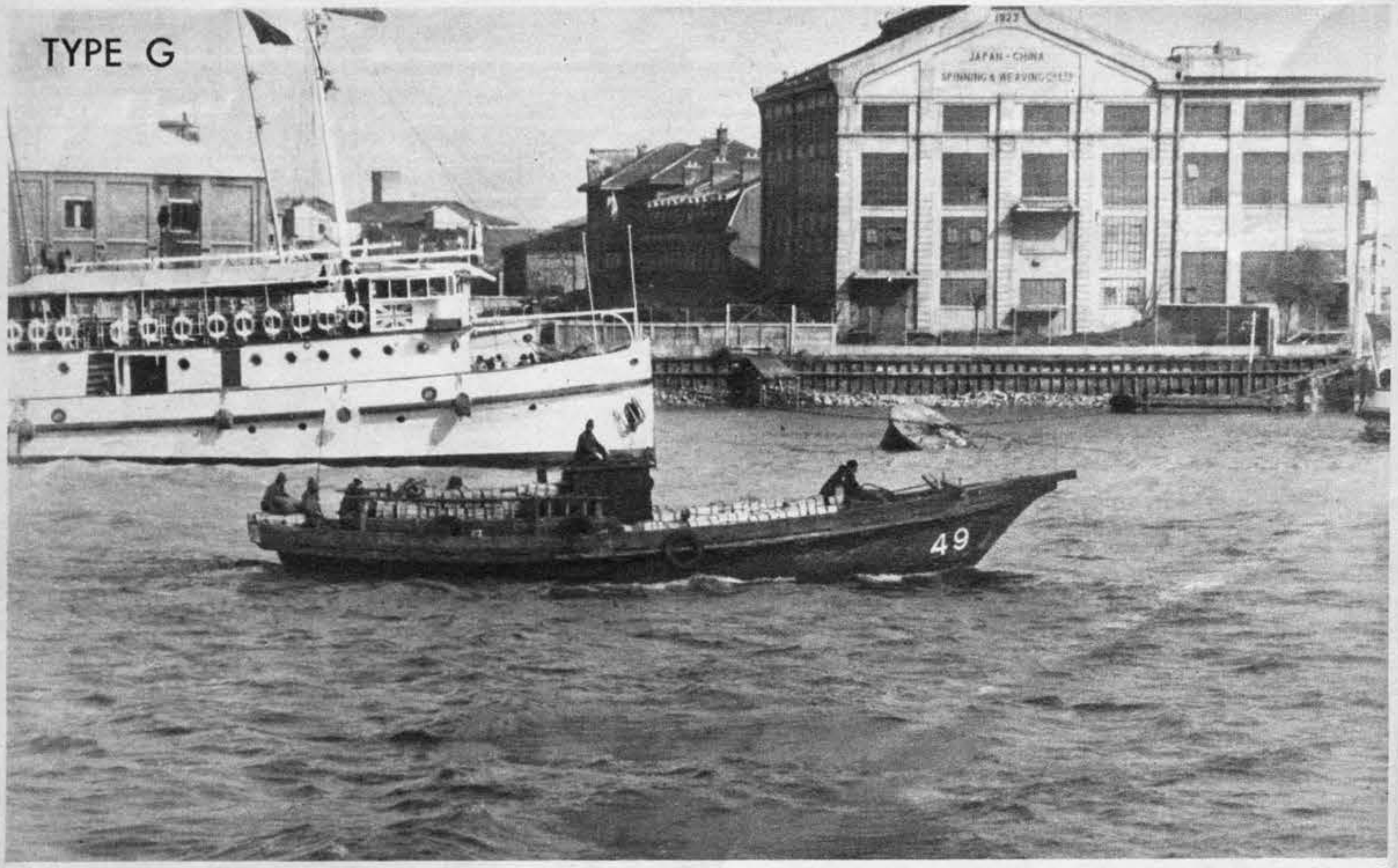
**TYPE F** is small personnel carrier, 21 ft. long, 7 ft. wide. Capacity is approximately 20 men. As far as is known, there is no armament. Movable crossbeam enables crew to shift compartment arrangements.



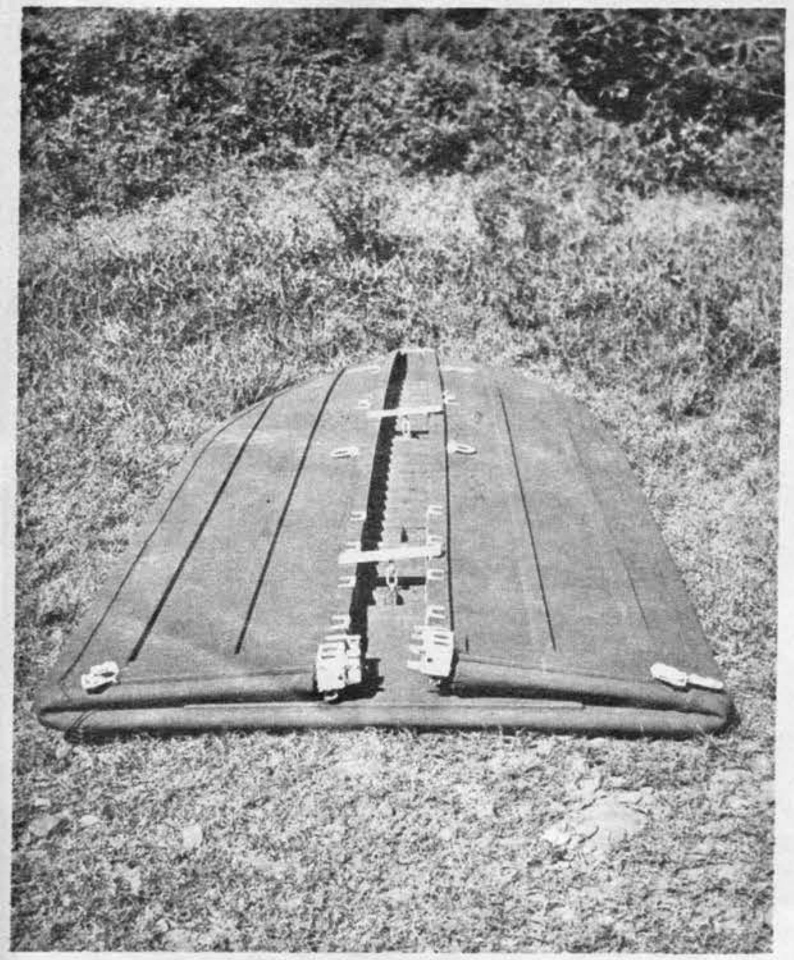
**NAVY LANDING AT HANKOW** was made in Type E barge driven by airscrew at stern. Flat bottom enables it to enter shallow waters through which ordinary boats cannot navigate.

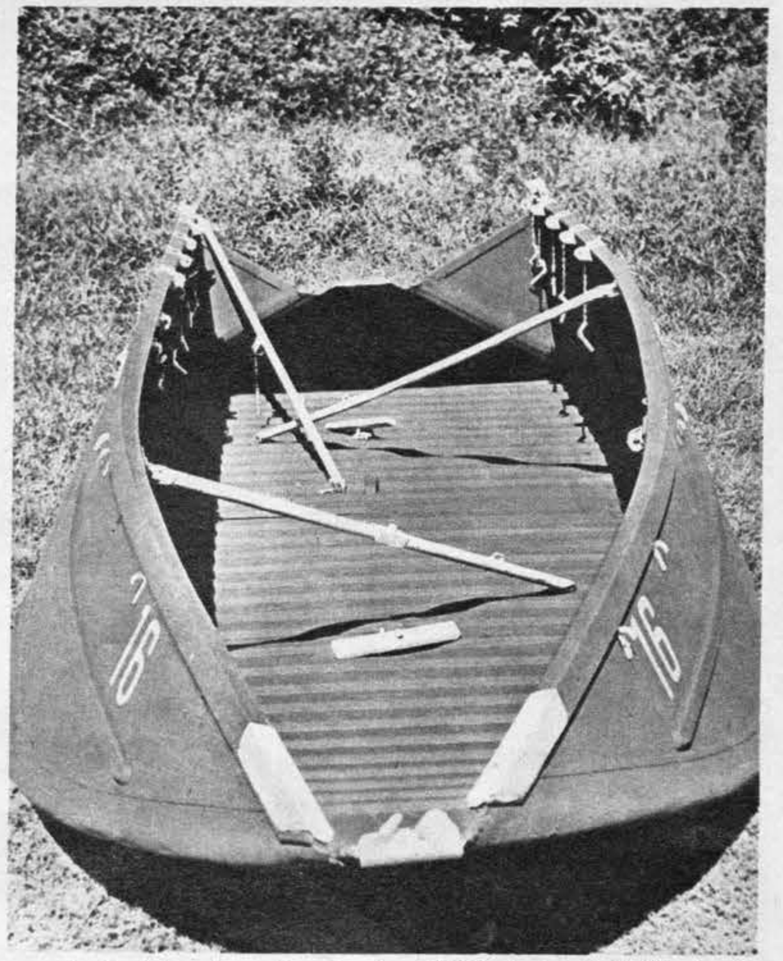


**LONG AND THIN, TYPE E** craft can be recognized by round machine-gun emplacement forward, airplane-type engine aft. Soldiers (approximately 60) are in five compartments. Type E is 63 ft. long, 9 ft. wide.



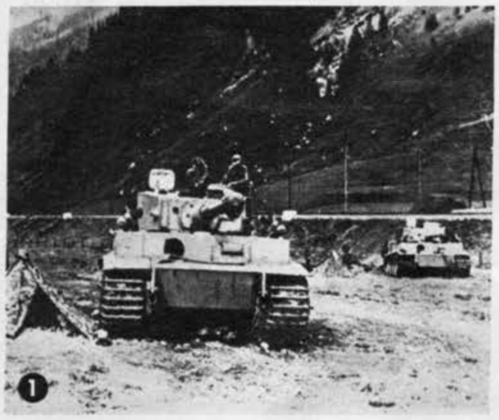
**TYPE G LANDING BOAT** is used to haul in reinforcements and supplies once beachhead is won. Craft is 52 ft. long, has beam of 13 ft., 8-knot speed. It is neither armored nor armed. Curved bow, better able to withstand impact, has replaced jutting prow shown above. Note deckhouse amidships.





**COLLAPSIBLE LANDING BOAT** is shown folded for easy transportation. Made of wood with rubber joints, craft is fitted for oars (*see oarlocks, above right*), may also be driven by outboard motor. Width at stern is 5½ ft., length about 15. Two units of this type may function as one with attached sterns.

# QUIZ NO. 2: TANKS, CARS AND GUNS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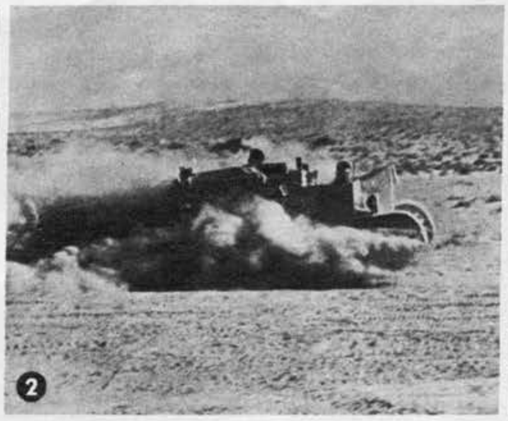
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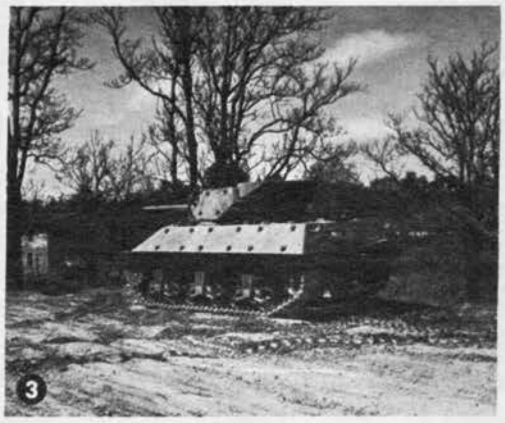
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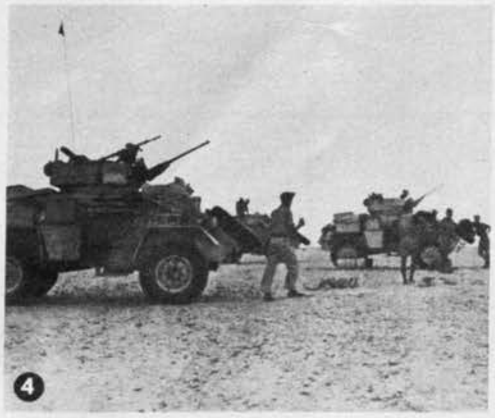
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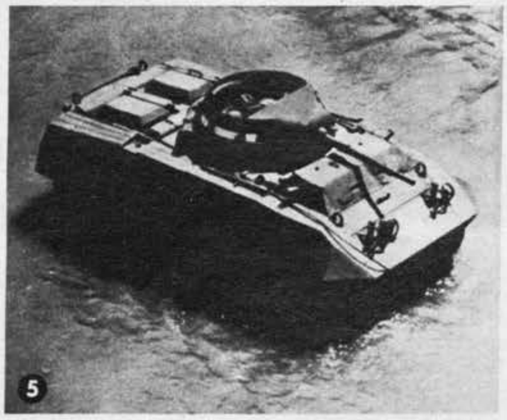
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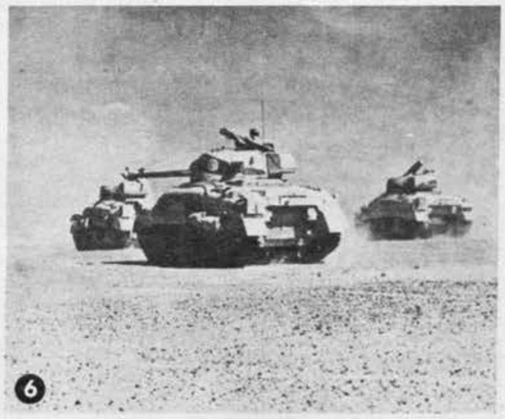
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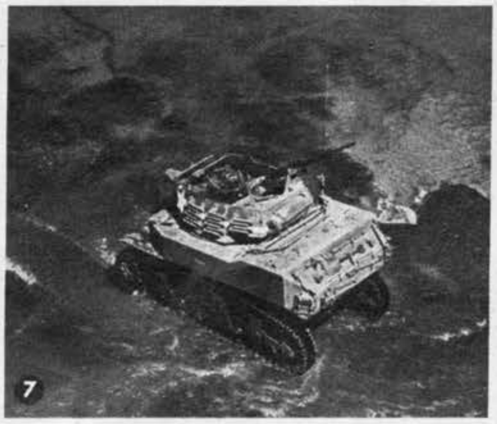
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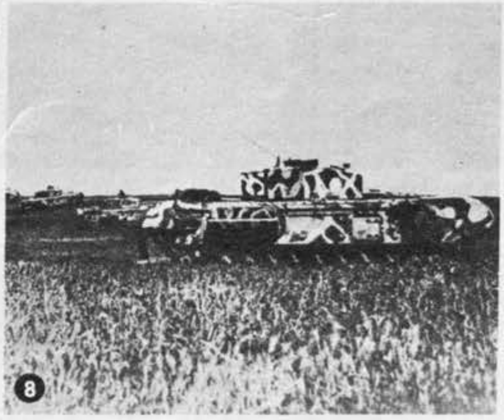
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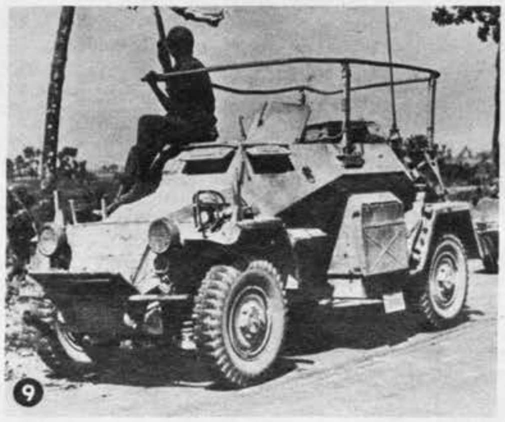
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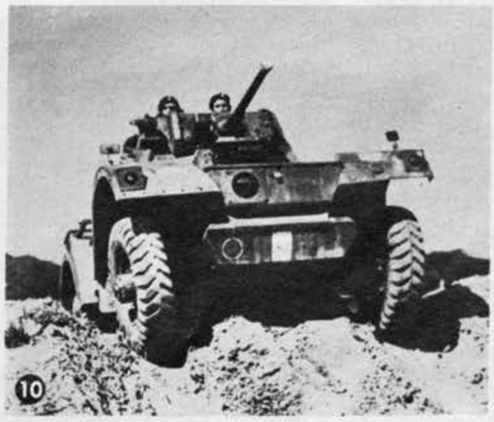
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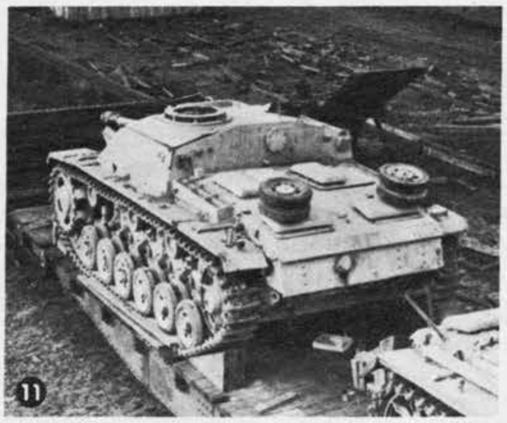
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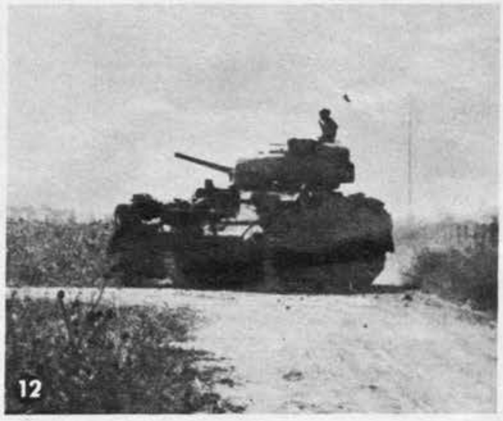
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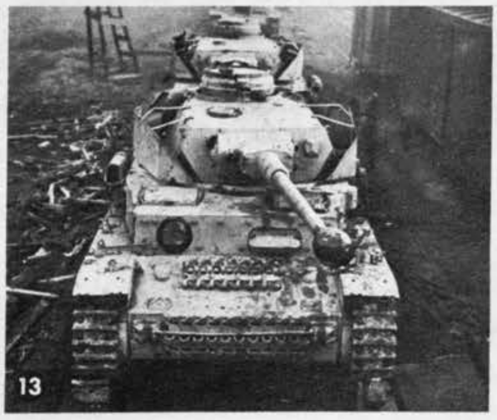
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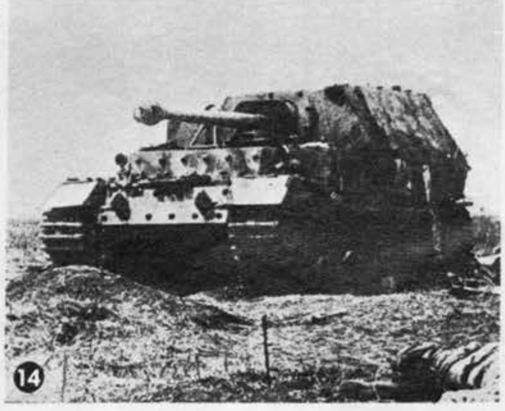
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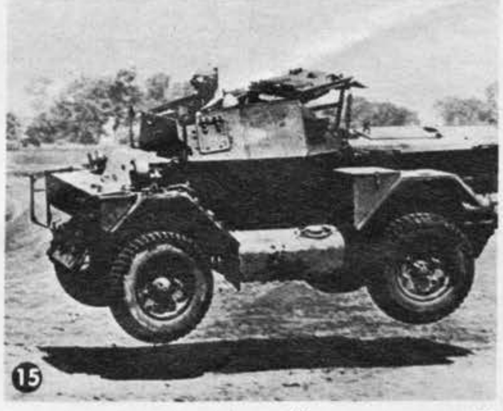
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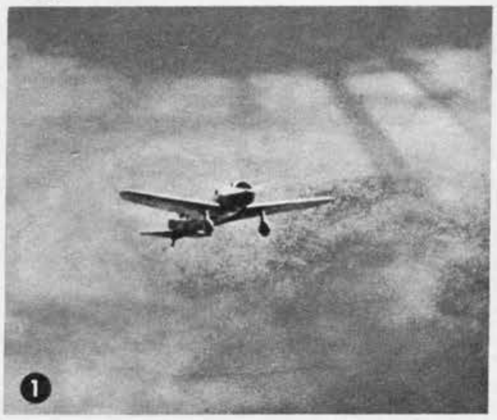
(For answers, see p. 50)

# QUIZ NO. 3: IN PACIFIC SKIES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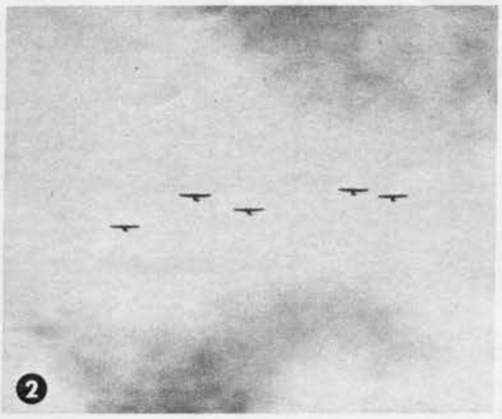
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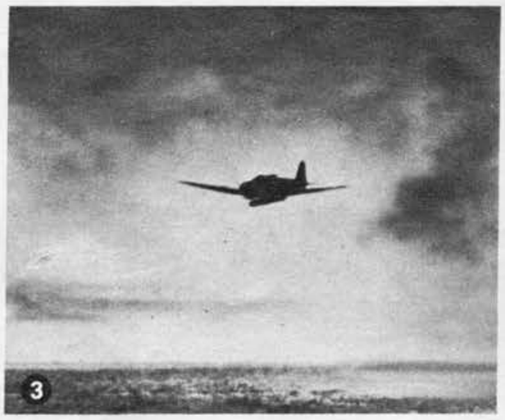
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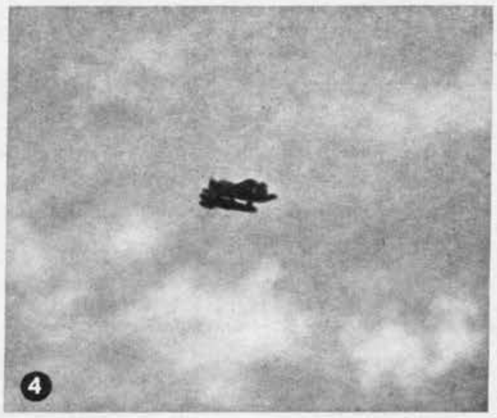
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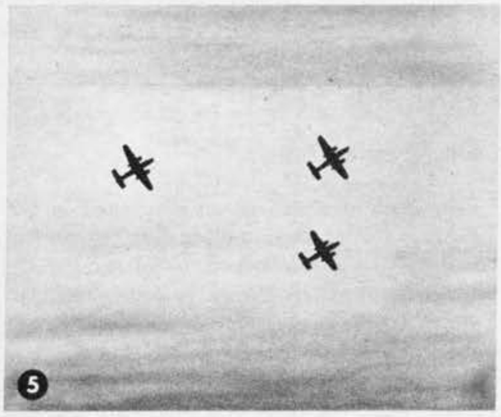
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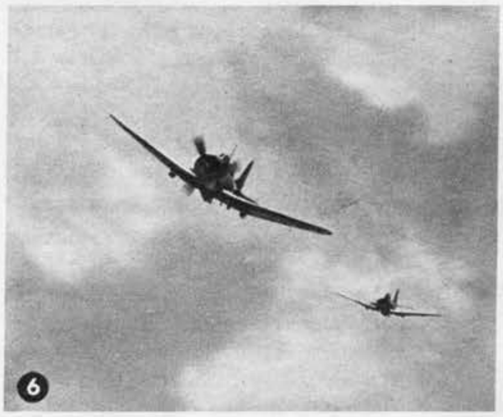
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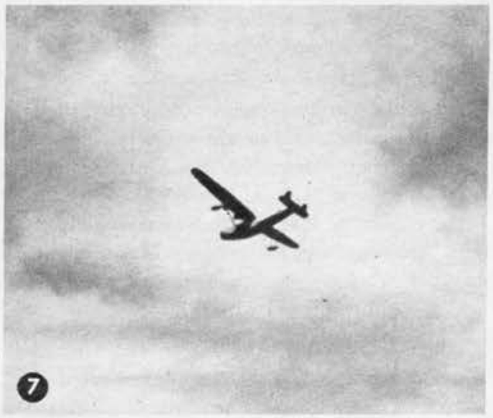
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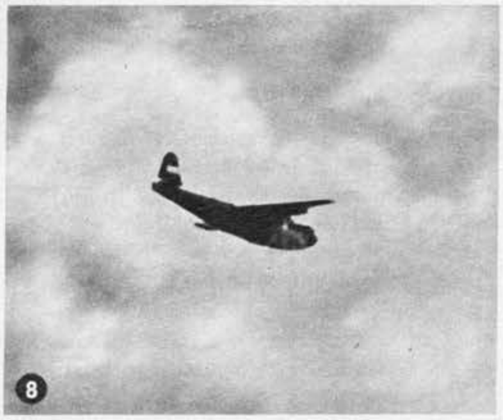
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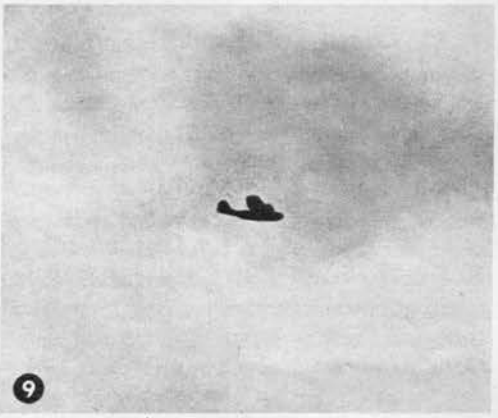
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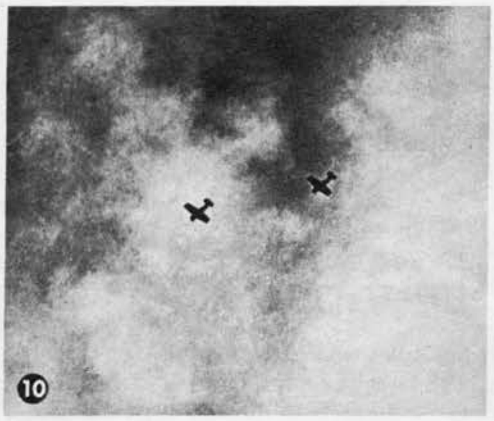
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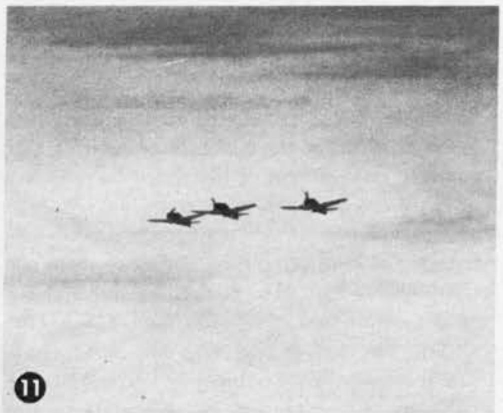
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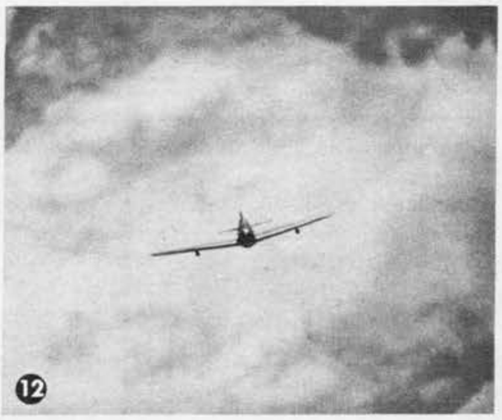
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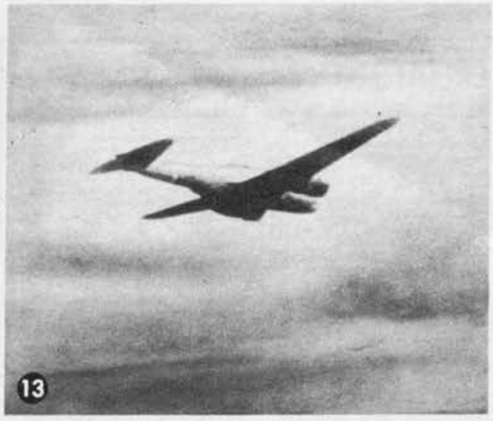
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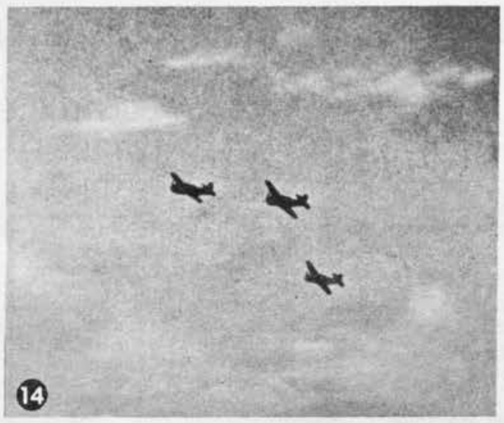
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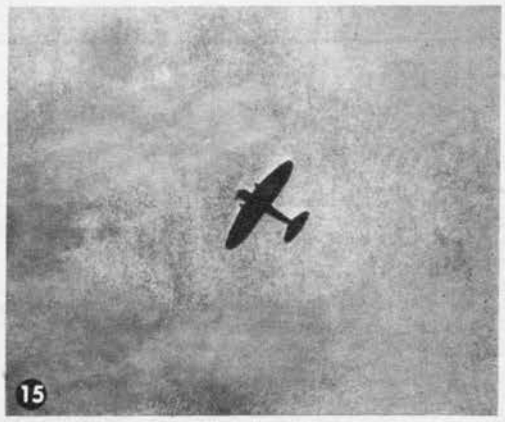
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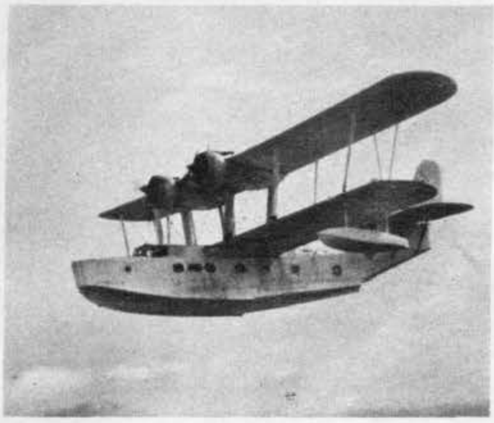
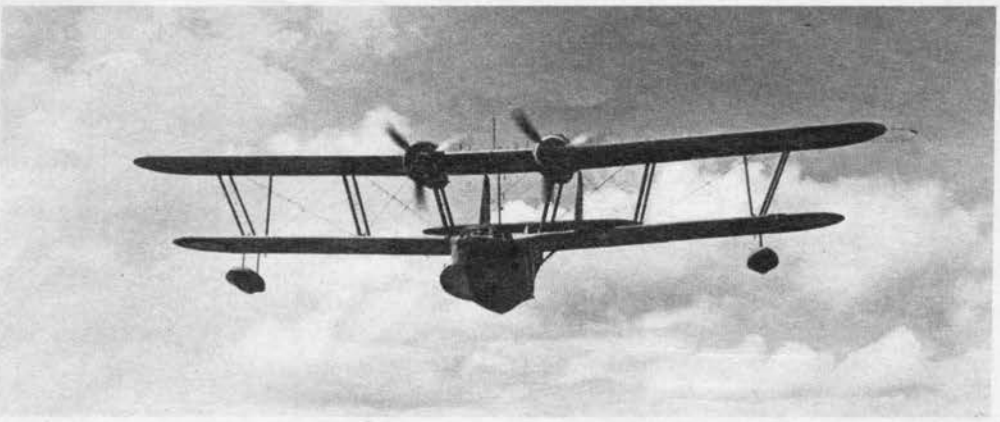
(For answers, see p. 50)

# NEWS & MISCELLANY



A CANADIAN STRANRAER FLYING BOAT ON PATROL



THIS UNIQUE BIPLANE FLYING BOAT MAY BE SEEN BY U. S. SHIPS PATROLLING CANADIAN WEST COAST

## NEWS

There are in operation off the West Coast of Canada a number of Stranraer aircraft, a British-designed flying boat built in Canada (*see above*). Following are some of the recognition features of the Stranraer: Flying boat biplane; wings have rounded tips with slight dihedral. Two radial engines mounted under the upper wing. Twin fins and rudders; broad tailplane, untapered with rounded tips; two-step metal hull, fixed wing-tip floats.

●

The engine cowling of the Zeke Mark 2 is about the same diameter but longer and more streamlined than on the older Zeke. Some Mark 2's have been found fitted with a bomb rack under each wing, probably designed for a 132-lb. bomb.

●

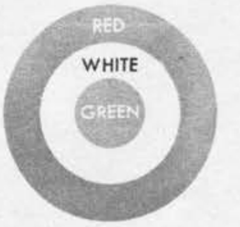
Recent photographs have revealed there are two types of tail turrets being fitted in Betty. Best-known turret fitted to the original Betty is long and cone-shaped. The second type seems to be a sawed-off version of the original, permitting a greater arc of fire. The armament in the new turret is probably a 20-mm. cannon.

●

The A-36 with its special dive equipment is slower and less maneuverable than its pure fighter prototype, the P-51. Divebombing, low-level bombing, strafing and an occasional escort mission are the chief tasks of the A-36's.

●

The sketch at right illustrates the markings to be used on all FRIENDLY Italian aircraft. The markings are on the wings and fuselage. There are no markings on the tail.



## TRAINING AIDS

### Ground Forces' Posters

Posters on all armored vehicles listed in the January training list are being distributed automatically by AG depots on the following basis:

Set No. 1 (U. S. Army vehicles)—one set per company or similar unit.

Set No. 2 (Allied and Axis vehicles)—one set per armored or tank-destroyer company or similar unit, and one set per battalion for other arms and services.

### Naval Aviation Activities

Five hundred transparencies of each new subject being produced for Recognition Training Program are being distributed to NAITC, NAOTC and to all operational activities. These are to be used to present new subject matter pending the manufacture and allocation of corresponding slides, shipment of which may not be made until some six to eight weeks later.

In the future, mimeographed lists, to identify the subject matter, will be included with each set of transparencies so distributed. As additional pictorial intelligence becomes available for manufacture into slides or film, CNO prepares successive issues of supplementary slide lists. These are distributed to activities to notify them of the coverage of such lists in advance of shipment of the slides themselves.

There are now in process some 600 separate photographs of planes and ships to be distributed as transparencies; and since most activities have limited or no facilities for making or obtaining temporary bindings, CNO, Op-33-D1, has ordered several thousand cardboard transparency holders which will be distributed at the earliest possible date in the proportion of ten holders for each set of recognition equipment. These holders have a slot in one side which enables one transparency to be substituted for another very readily. The subject is identified on each individual transparency referred to herein.

## NAVAL AVIATION ACTIVITIES

Publications recommended for use by recognition officers attached to Naval Aviation Activities. Following is a complete up-to-date list of recognition publications and supplementary ONI material which are recommended by the Aviation Training Division for use by all recognition instructors attached to aviation activities. Additional coverage will be included in guides or supplementary pages to the manuals:

Pictorial Manual (BuAer 3)
Pictorial Manual on Naval Vessels
Recognition Instructors' Handbook
U. S. Army-Navy Journal of Recognition
Guide to Recognition of Merchant Ships
Guide to Recognition of Landing Craft
ONI 209 (Merchant Ships)
ONI 223 (Ship Shapes)
ONI 225-J (Jap Landing Craft)
ONI 54-R-LC Supplement No. 4 (U. S. Landing Craft)
ONI Photo File No. 1 (U. S. Ships), No. 2 (Jap Ships), No. 3 (German Ships), and No. 4 (British Ships)
ONI Charts, GN (German Ships) and JN (Jap Ships)
ONI 201 Supplement No. 1 (British DD's)

## CORRECTION

Craft in photo on bottom of page 43 of Feb. 1944 issue of *Recognition Journal* are correctly identified as YMS-Motor Minesweepers.

## QUIZ ANSWERS

### QUIZ No. 1:

1. L to R: Fletcher DD; Farragut DD; Flush-decker APD; Flush-decker DM; Fletcher DD
2. L to R: Independence CV; Essex CV; South Dakota BB; North Carolina BB; Essex CV
3. L to R: Brooklyn CL Class (3)
4. L to R: Modern Tanker; Modern Tanker; Liberty Ships in distance; Old Flush-decker DD
5. L to R: Fletcher DD: New Mexico BB; New Mexico BB; New Mexico BB; Cleveland CL; Portland CA

### QUIZ No 2.

1. German PzKw VI Tiger
2. British Universal Carrier
3. U. S. M-10 Self-propelled Gun
4. British Humber Armored Car
5. U. S. M-8 Armored Car
6. U. S. M-4 Sherman
7. U. S. M-8 Self-Propelled Howitzer
8. British Churchill
9. German 4-wheeled Armored Car
10. British Daimler Armored Car
11. German Self-propelled 75-mm. Gun on PzKw III Chassis
12. U. S. M-4 Sherman
13. German PzKw IV
14. German Self-propelled 88-mm. Gun Ferdinand
15. British Lynx Scout Car

### QUIZ No. 3:

1. Nate T-97
2. Catalina
3. Kate T-97
4. Kingfisher
5. Mitchell
6. Dauntless
7. Mavis
8. Emily T-2
9. Catalina
10. Wildcat
11. Hellcat
12. Tony T-3
13. Lily T-99
14. Avenger
15. Val

### QUIZ No. 4:

1. Do-217
2. Short Stirling
3. Typhoon
4. Lancaster
5. TBF
6. Zeke
7. Spitfire IX
8. FW-190
9. PBY
10. SBD
11. P-47
12. Ventura
13. FW-200C
14. Mosquito
15. Ju-52

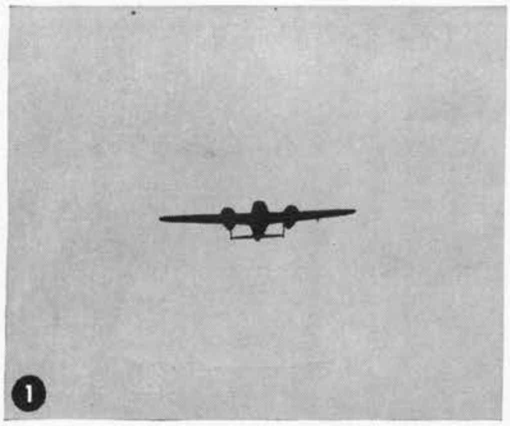
## CREDITS

The pictures used in the Journal, unless otherwise specified (see *below*) came from the Allied Armed Services.

Cover—Eliot Elisofon
2—Matthew Greene
7—Fourth row, J. R. Eyerman
10-11—Bot., left and right, W.W.
12—Frank Scherschel
13—Lt. Thomas B. Hollyman
14—Top, Hans Groenhoff; bot., Margaret Bourke-White
16—Top, Ralph Morse; bot. left, Frank Scherschel
17—Bot. right, A.P.
18—Top, Lt. Thomas B. Hollyman; cen. and bot., Bernard Hoffman
19—Top, A.P.
20—Frank Scherschel
21—Right, Int.
24—Bot. right, (c) Planet News Ltd.
32—Bot. right, Paramount News from A.P.
36—Bot. left, William C. Shrout
46-47—Top cen. and right, Paul Dorsey
49—First row cen., Peter Stackpole; Second row right, Frank Scherschel; Third row right, Walter B. Lane; Fourth row left and cen., Frank Scherschel; Fifth row cen., Peter Stackpole

Abbreviations: A.P., Associated Press; W.W., Wide World; Int., International

# QUIZ NO. 4: AIRPLANE ANGLES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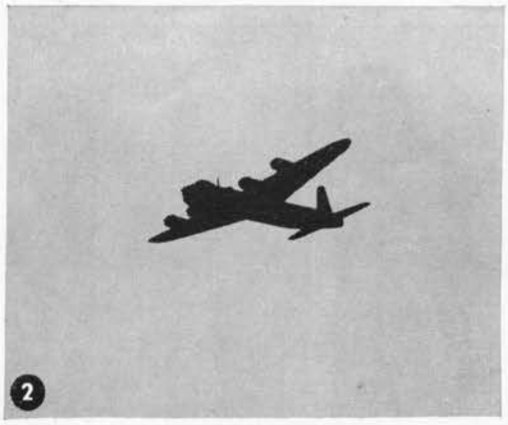
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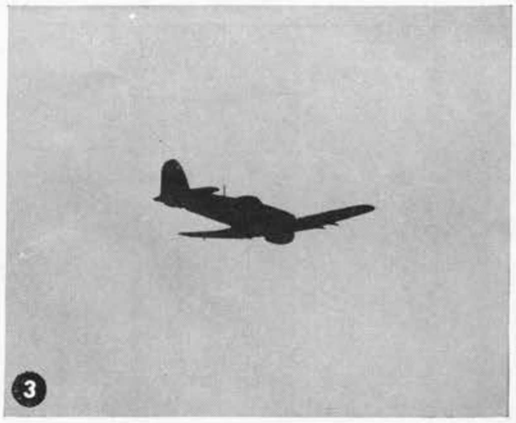
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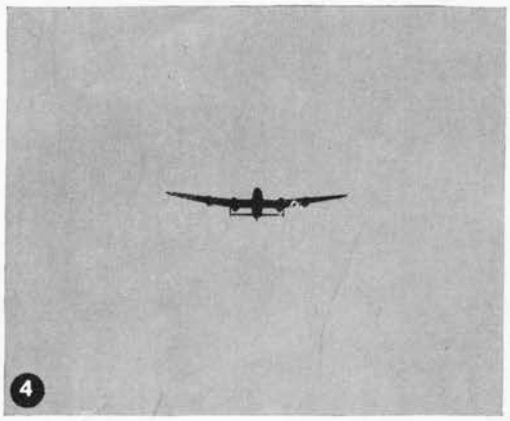
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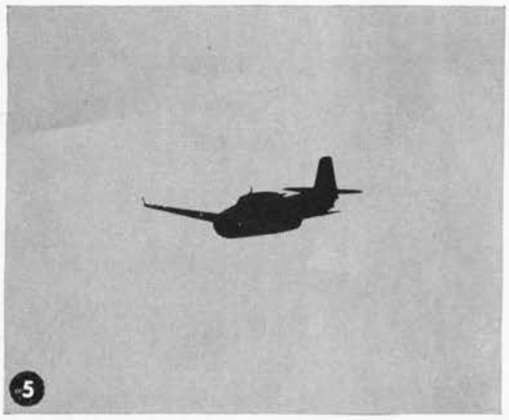
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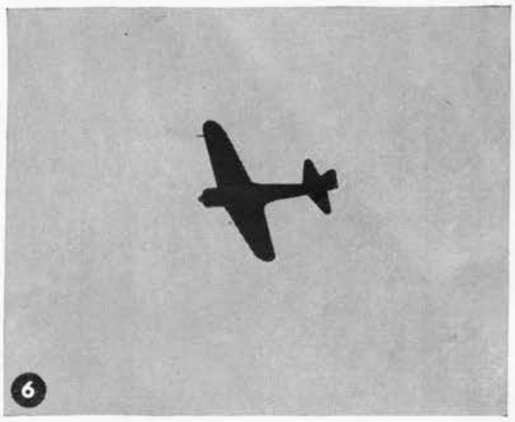
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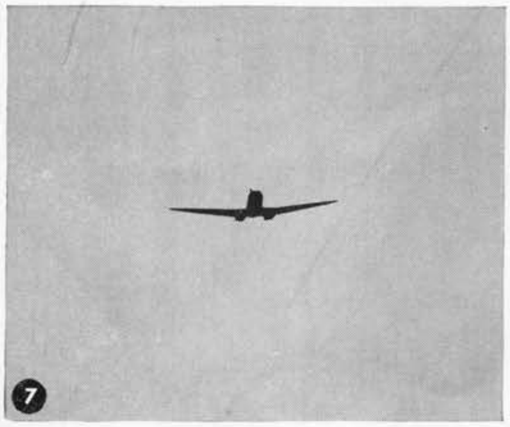
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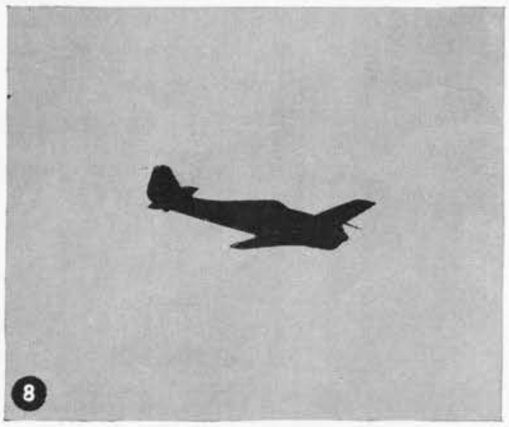
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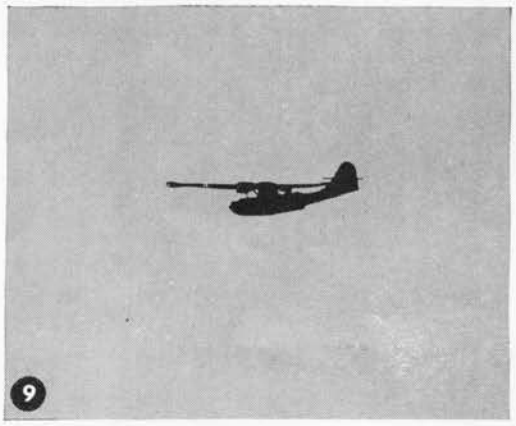
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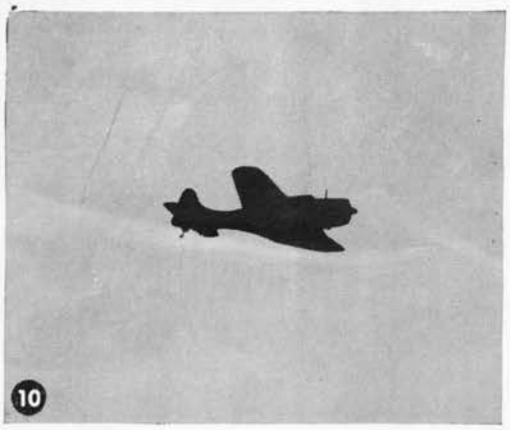
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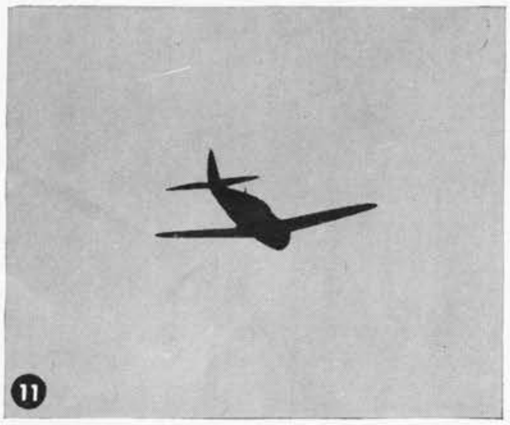
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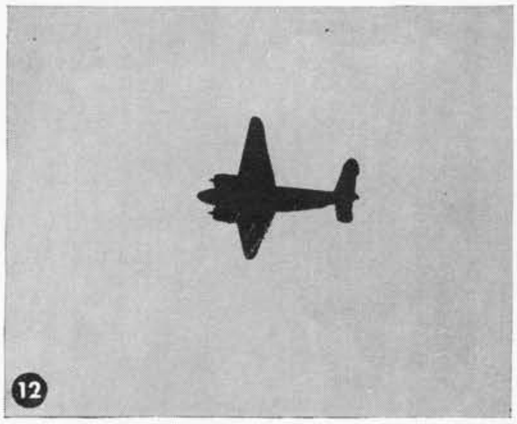
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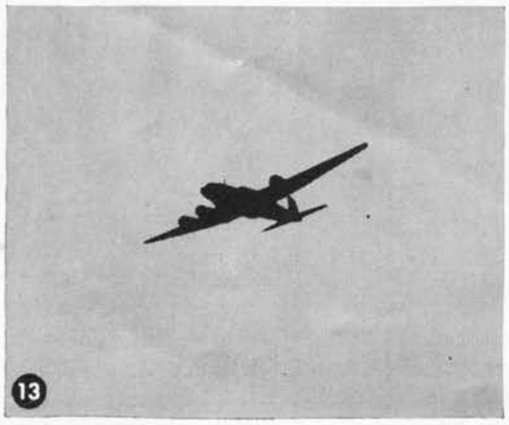
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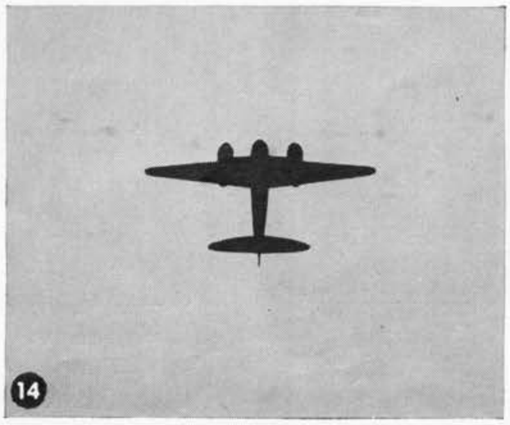
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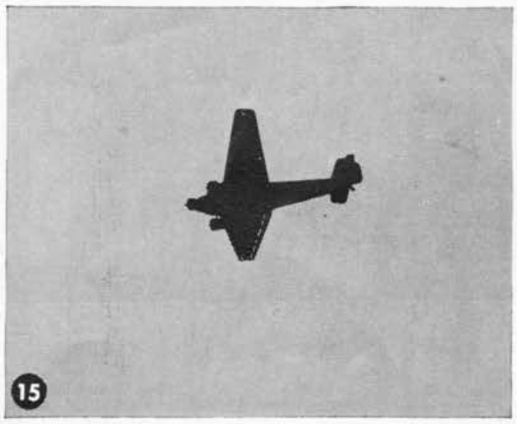
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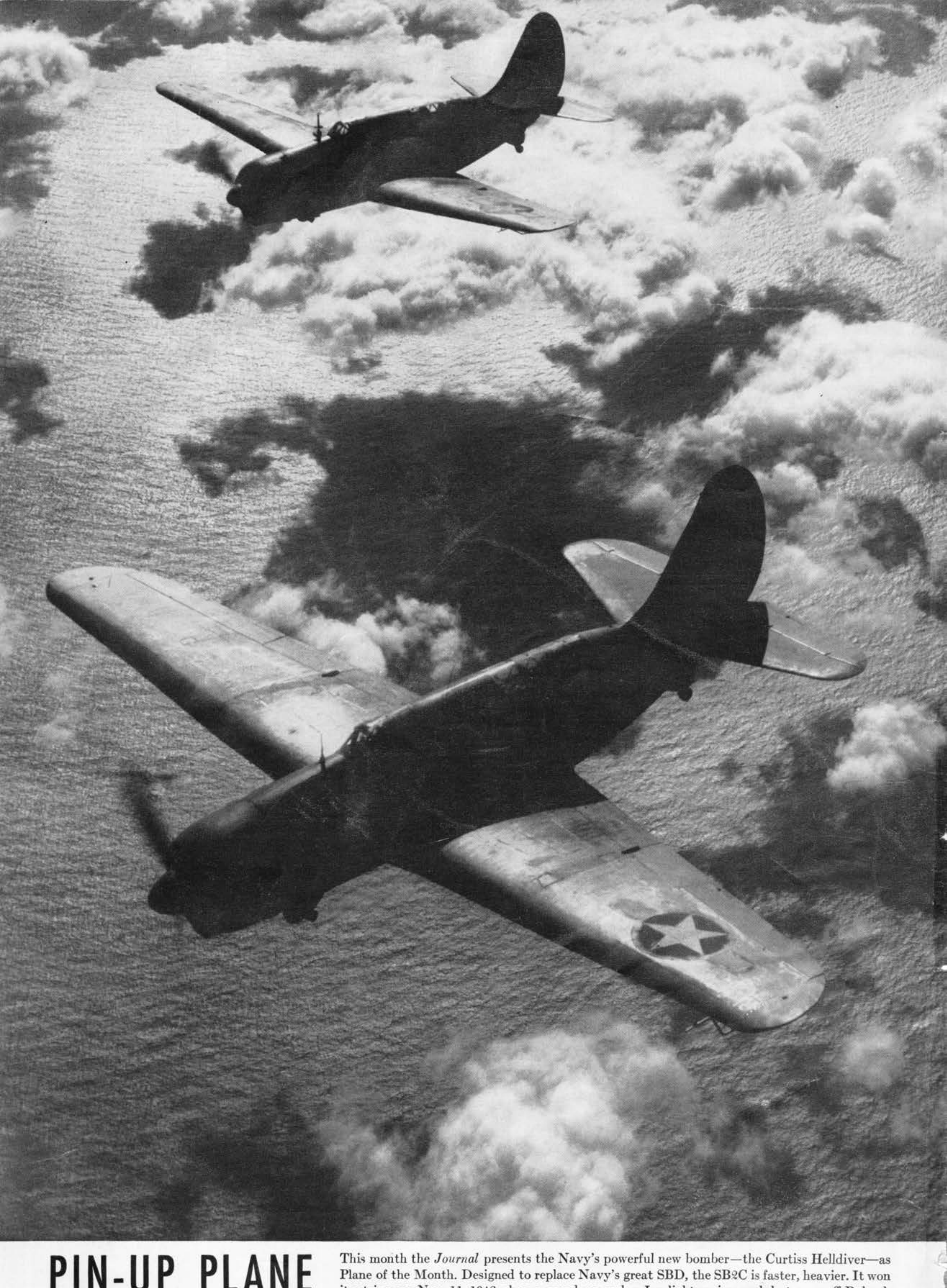
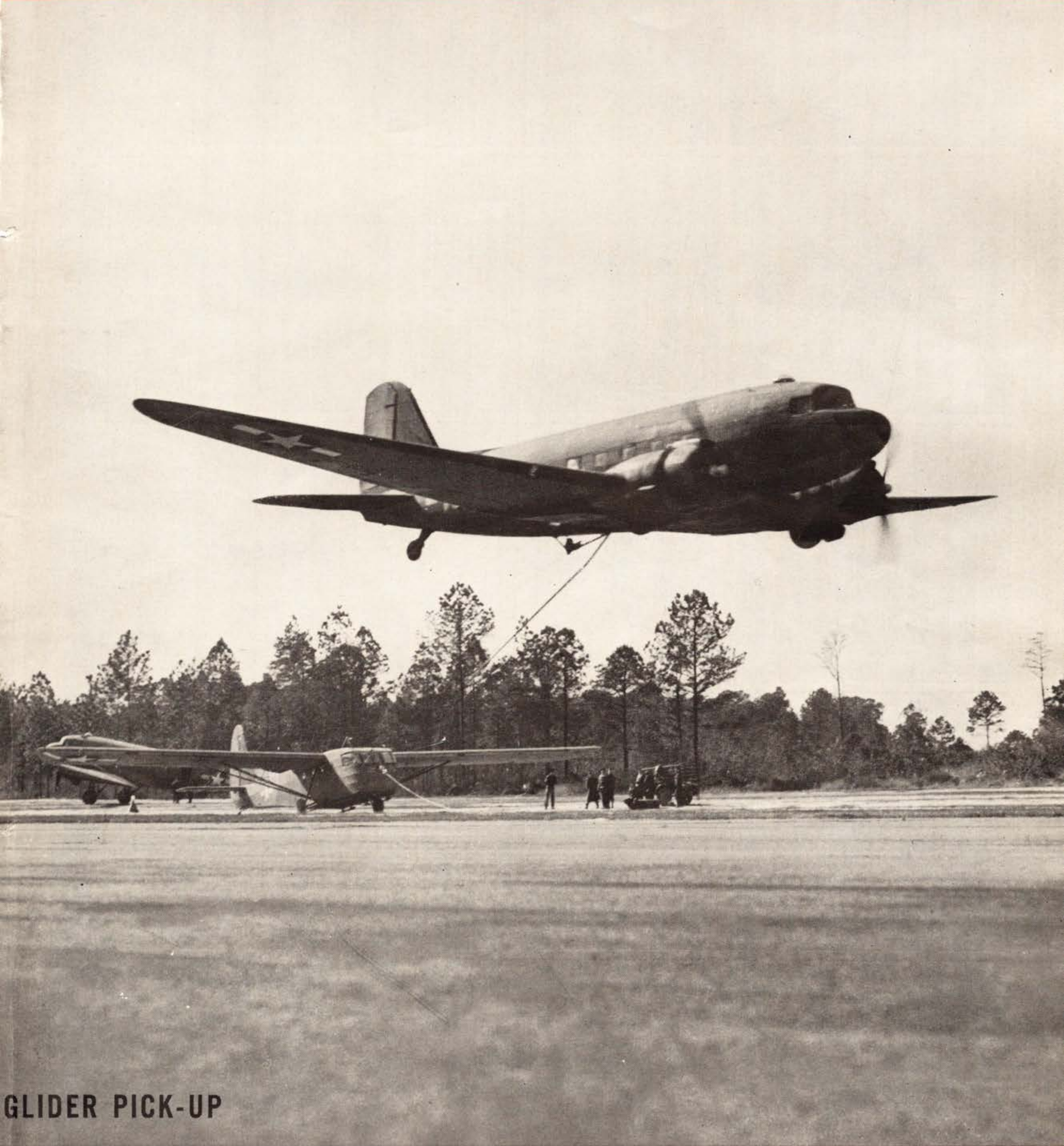
For answers, see p. 50



**PIN-UP PLANE** This month the *Journal* presents the Navy's powerful new bomber—the Curtiss Helldiver—as Plane of the Month. Designed to replace Navy's great SBD, the SB2C is faster, heavier. It won its stripes on Nov. 11, 1943 when a squadron sank a Jap light cruiser and destroyer off Rabaul.

U. S. ARMY-NAVY JOURNAL OF

# RECOGNITION



GLIDER PICK-UP

APRIL, 1944
NUMBER 8

[redacted]

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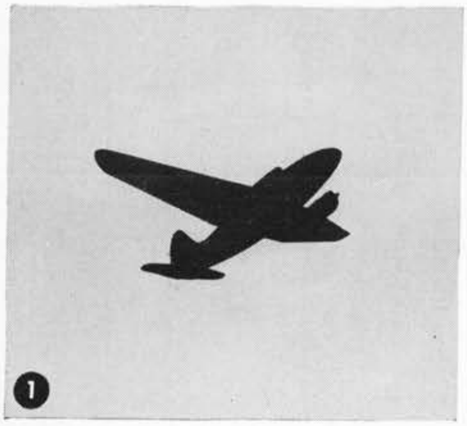
# QUIZ NO. 1: TWIN-ENGINE SHADOWS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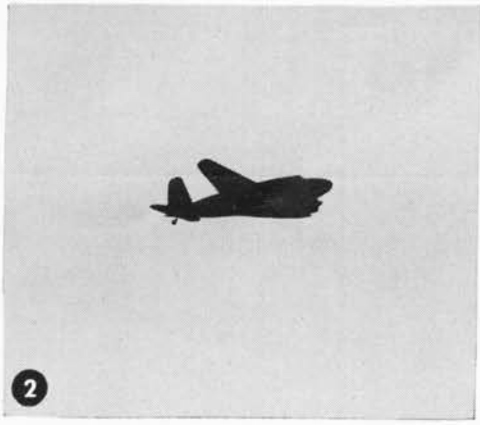
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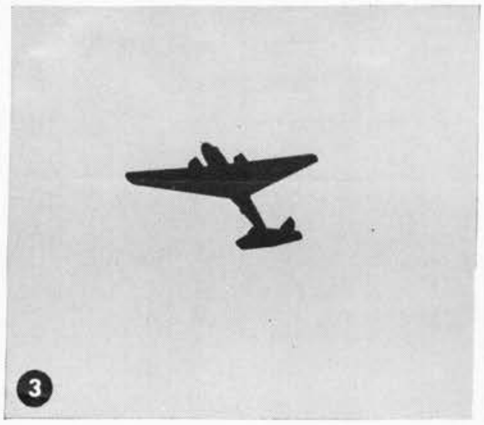
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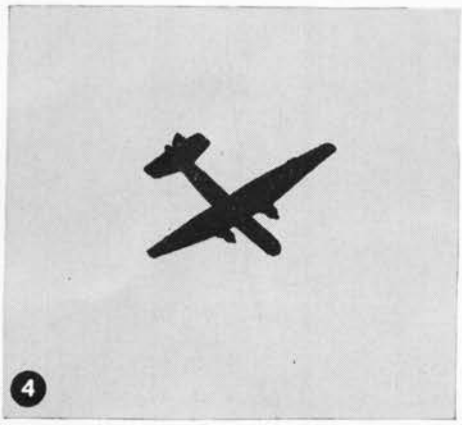
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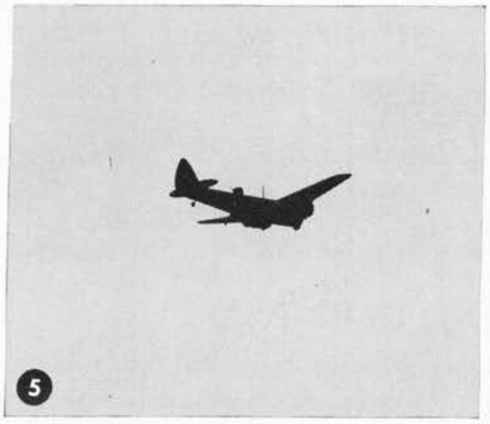
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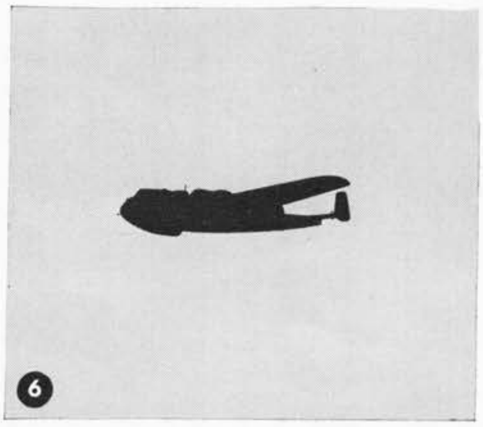
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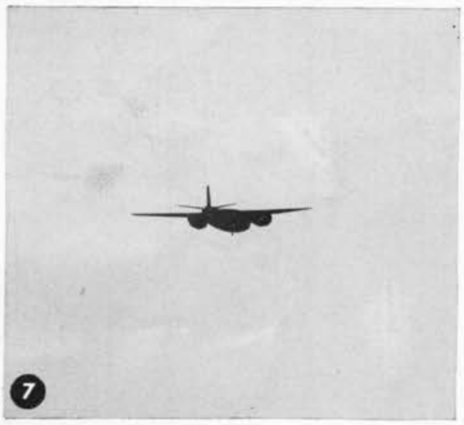
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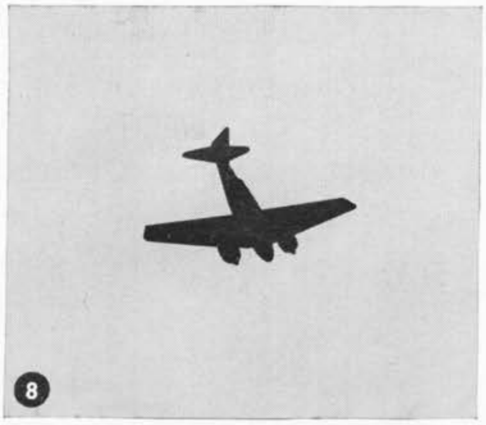
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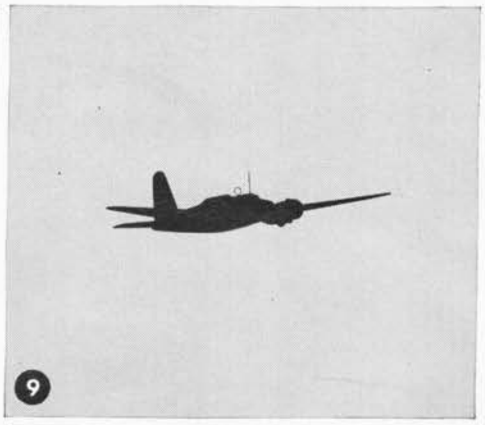
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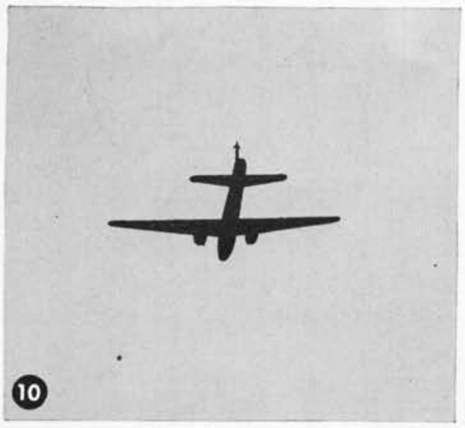
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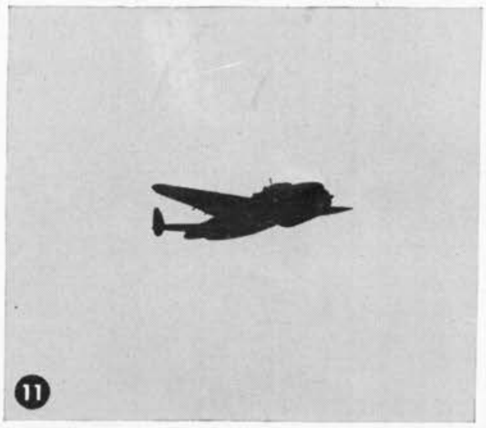
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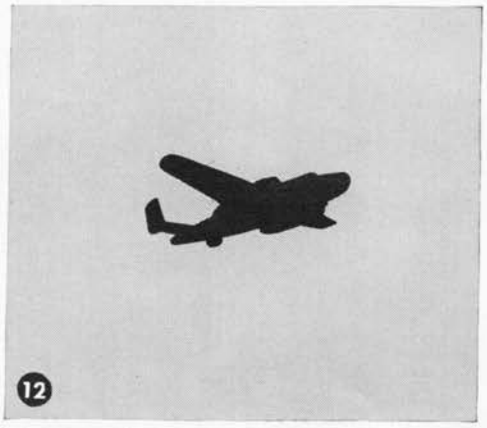
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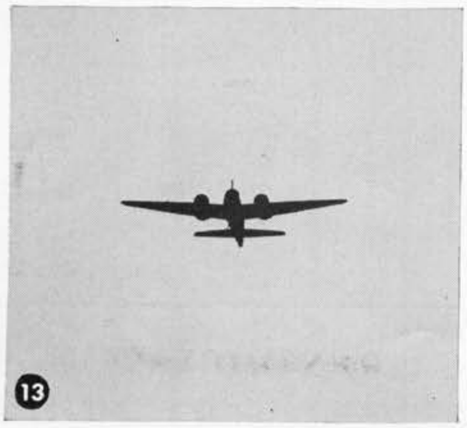
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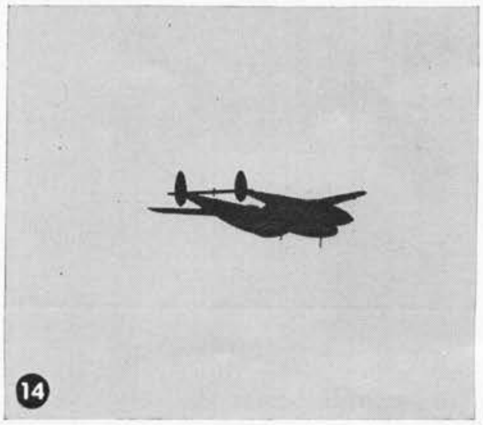
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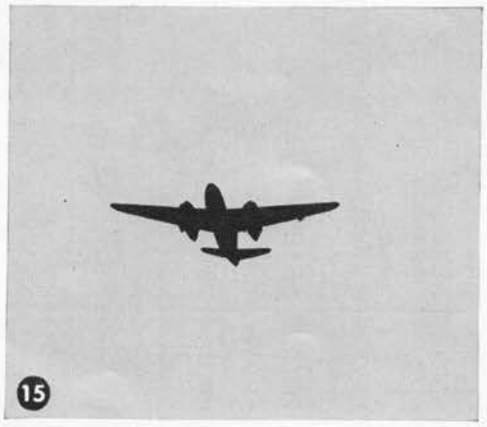
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For answers, see p. 50

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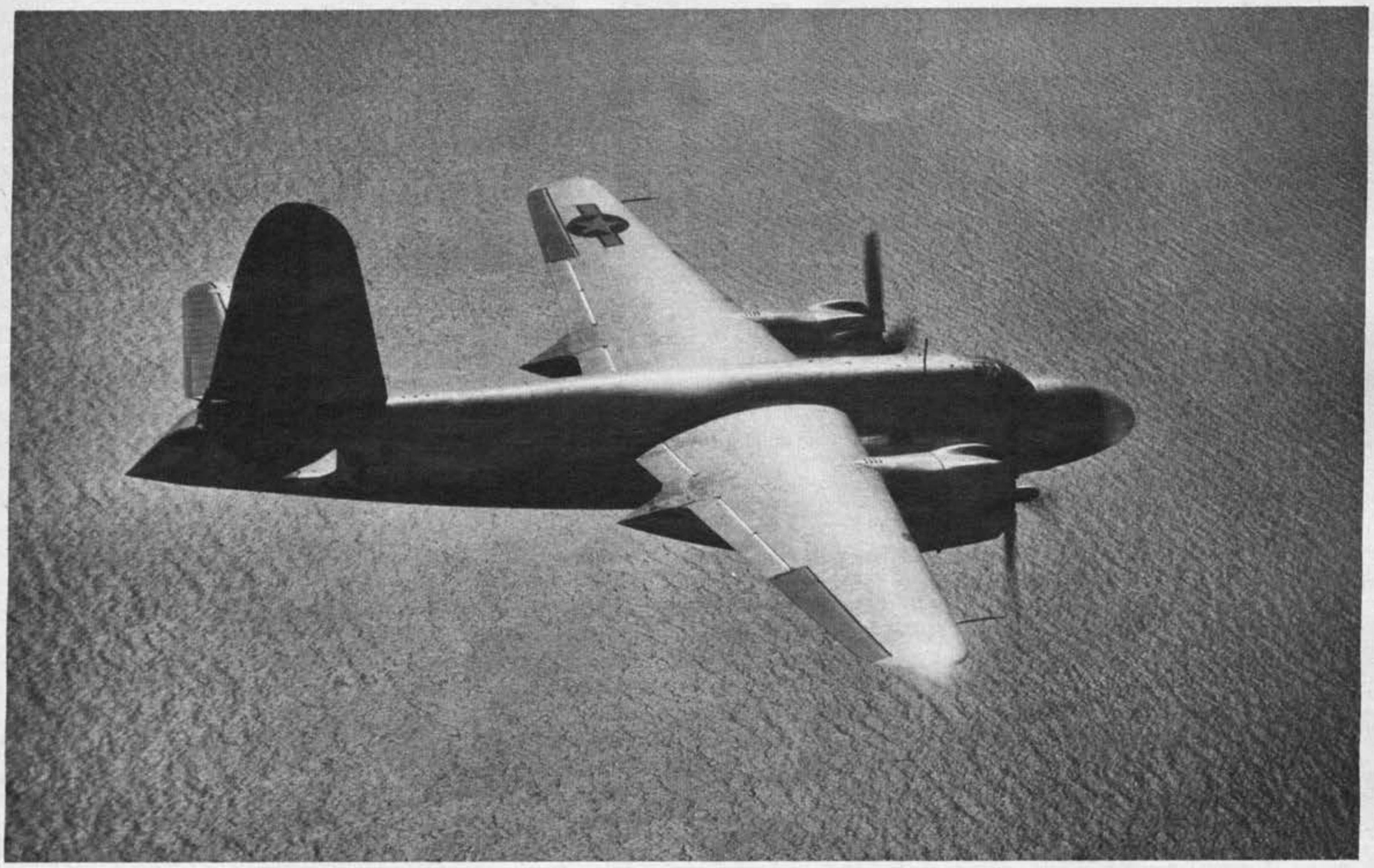


BEAUTIFUL LINES OF B-26 MARAUDER ARE WHAT MAKE IT FLY. WING SHAPE, TAILPLANE DIHEDRAL, STREAMLINED FUSELAGE EACH AFFECT THE PLANE'S PERFORMANCE

# WHY THEY FLY

This article originally appeared in the May 17, 1943 issue of *Life* magazine. It was written by Wolfgang Langewiesche, author of *I'll Take the High Road* and a forthcoming book on the art of flying, *Stick and Rudder*. Langewiesche is at present a test pilot for Chance-Vought.

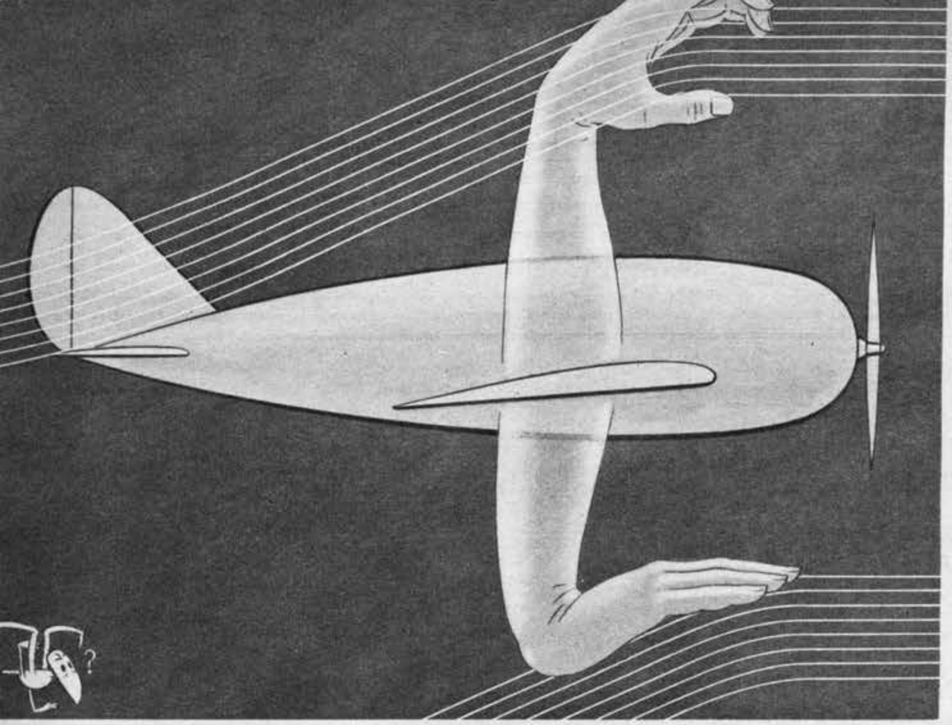
What makes an airplane fly is not its engine or its propeller. What makes an airplane fly is simply its shape—and the impact of the air upon its shape. This—that its shape is what counts—is what makes the airplane so beautiful. It also makes it easy to understand. You don't have to open it up and look at "the works" inside as one has to do with a watch, or an automobile. An airplane's outside appearance is its "works." If you want to understand it, simply have a look.

Look at the wing. It holds the airplane up entirely by its shape. A wing is nothing but an air deflector set at such an angle that it will catch the air and push it down. The air, resisting, pushes back up against the wing's bottom surface and that gives it some lift. At the same time—and this is more important—the wing also creates a lack of air on its top surface because of the way it is curved there. Thus it sucks air down from above. That air, resisting, sucks back upward on the wing's top surface and this is what gives the wing most of its lift.

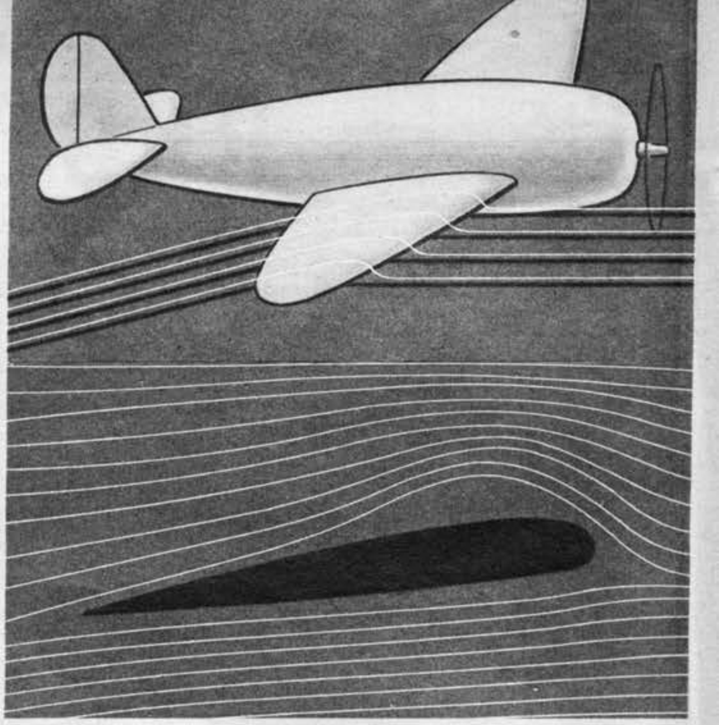
And that's all there is to a wing! Man's greatest invention since the wheel and the boat—the thing that carries weights through thin air—is just a shape. As for the exact shape that will make the best wing, a whole science is concerned with that—aerodynamics. What counts most is the wing's cross section. It has been found that the wing with the highly arched top surface and a concave under surface will carry most weight. The early airplanes had that kind of wing. But a more streamlined cross section will carry good weight too and slide through the air more easily. Hence modern fast airplanes' wings don't have that hollowed-out under surface. But all such engineering refinements don't change the main idea of the wing: a wing is a shape that holds itself up by acting on the air.

It is simple. The law is the old one of action and reaction: if you push against *anything*, that thing resists and pushes back against you. As the gun pushes the bullet forward, the bullet kicks the gun backward making it recoil. What seems so strange about flying is merely that the thing we work against is air. And air is strange stuff. Because we cannot see it, we think of it as a nothing. Because we cannot pinch it between our fingers, we think of it as empty space. And thus an airplane seems to sit up there in empty space, held up by nothing.

Actually, air is just as real as water. It has density and body.



**WHAT A WING DOES** is shown above. The bottom surface pushes air down, like a hand pushing through air. Upper surface lifts wing, like hand pulling down at air.



**AIRFLOW** is the motion of air over wing, holds plane up. In straight flight, air moves smoothly underneath, humps up on top surface.

## WHY THEY FLY (continued)

It is a thick and slightly sticky fluid. Its tendency to stick to the skin of an airplane causes much headache to the engineers. It has weight. A cubic yard of air weighs about 2 lb. Thus if we could only see the air, all the mystery would go out of flying at once. We could then see the fierce attack with which the wing smashes into that stuff. We could see the terrific downward wallop which the wing gives to thousands of pounds of air every minute. And we could see that everywhere in the wake of an airplane, the air is in downward flow and keeps swirling and eddying for many minutes when the airplane itself is already miles farther on.

The magic shape of the wing can't have effect, of course, unless it keeps continually attacking new air. If an airplane is to keep flying, it must keep moving. It can't ever stop or even slow down much. The wings then can no longer catch the air at the proper angle. The lift goes out of the wings, the airplane drops. That is what is called a stall. A "tailspin" is nothing but a fancy stall. One wing makes lift and wants to fly, the other wing is stalled and keeps dropping. Between them they twist the airplane down in a corkscrew motion. Normally, pulling back on the stick makes the airplane go up. But in the spin or stall, the harder the pilot pulls back, the more obstinately the airplane goes down. The more it goes down, the harder the pilot's self-preservation instinct makes him pull back on the stick. The way to recover from a stall or spin is to get the stick forward, diving at the ground to pick up new speed. But that takes courage. A stall or spin means quite a drop—dozens of feet in a Cub, thousands of feet in a bomber. It is because a wing needs speed that airplanes need big airports. They can't fly until they have gathered speed, and they dare not slow up again until they are firmly on the ground. It is because a wing needs speed that the first rule of the art of piloting, contrary to all common sense, is this: keep your speed. If you want to be safe, *don't* go slow, go fast. When in doubt, speed up.

Just how fast must an airplane fly in order to be safe? This depends on the airplane's shape. If in proportion to its weight the plane has big wings, it can fly slowly. If it has small wings, it must fly fast. That's what "wing-loading" means, the proportion between an airplane's weight and the size of its wings. A very speedy medium bomber has a square foot of wing for every 60 lb. of its weight; a slow Cub has ten square feet of wing for every 60 lb. of its weight. The bomber needs 110 m.p.h. or it will stall; the Cub will hang on at 35 m.p.h. A heavily wing-loaded airplane is fast but "hot," needs big airports and, if stalled, it will drop hard and deep. A lightly wing-loaded airplane is slow but more forgiving of pilot mistakes. But all airplanes must keep moving. The way we keep the airplane going is to give it its own source of power, an engine and propeller. The propeller is like a wing.

The propeller keeps the airplane moving forward. It doesn't lift, it drives just as the propeller of a ship drives an ocean liner. The propeller, like the wing, works upon the air by shape. Each propeller blade is nothing but an "air foil," a shape much like an airplane wing to catch and make use of the air. In fact, a propeller blade's cross section has exactly the same curves as a wing's cross section. The propeller blade catches the air and throws it backward and by so doing gets a forward force.

Because the propeller is driven by a motor, it is almost the same thing as an electric fan; the two look slightly different only because they are used differently. In the propeller you don't use the backward blast of air, but you use the kick-back and you allow it to make plenty of noise.

How big a propeller, how powerful an engine does it take to keep the airplane going fast enough so that it will fly? The amazing, the at first quite incredible thing, is that it takes very little force. A one-man glider weighing 500 lb. can be pulled through the air by a force of only 20 lb. A child in the rumble seat of the tow car could easily hold the tow rope in his hand and keep it flying. For ordinary airplanes, the figures are only a little less favorable; to keep a 10,000-lb. airplane flying takes only about 1,000 lb. of propeller pull at slow speeds.

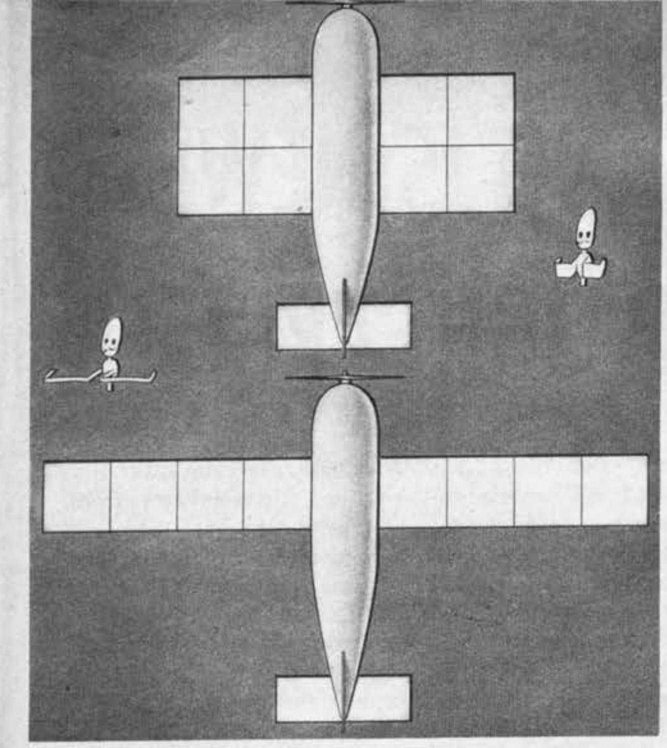
The force that holds an airplane back, the force which the propeller has to overcome to keep the airplane going is called the drag. Like everything else about the airplane it depends on the shape, and hence you can see it, if you know where to look.

The wing itself makes a drag: the deflecting of air requires force. This drag—the price which we must pay for lift—is called the induced drag, and it depends much on the shape of the wing. A narrow wing of long span catches much air, gives it a gentle push and requires little force. A broad wing of short span catches less air, gives it more of a push and requires more force. This is why patrol bombers and other long-distance airplanes have long narrow wings they get more miles per gallon that way. That is also why gliders have long narrow wings; they slide more easily. Wingtip shape, too, has much to do with this induced drag: on a square wing, the tip plows too hard, and some of the rest not hard enough, a tapered wing works more easily, slides more easily.

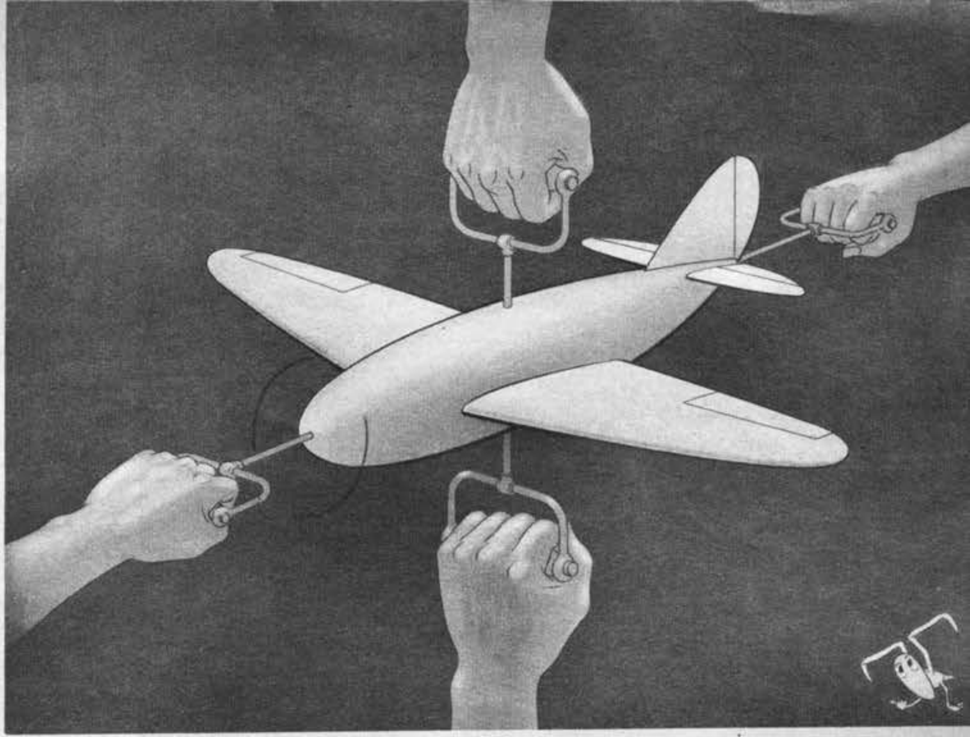
Another drag is skin friction: the air, molasses-like, clings to the skin, and the airplane can't move without dragging a lot of air around. An airplane actually won't dust itself off in flight: if it goes up dusty, it comes down still dusty. The reason is that next to the skin, the air hardly slides at all.

That's why it is important that the shape of an airplane be absolutely smooth: in an airliner or a bomber even the tiny roughness of the rivet heads on the skin cause a drag force of a couple of hundred pounds. Racers and soaring gliders are polished with a cloth before each flight.

But the biggest thing that holds the airplane back is obvious, the many parts of the airplane that are not wing. The wing is the airplane's essential part—it makes the lift. Yet an airplane also needs space for passengers and cargo, a pilot seat with windshield,



**ASPECT RATIO** is ratio of the length to the width of wing. It is low in fast maneuverable fighter planes (*top*), high in bombers.



**FOUR FORCES** work like giant hands on airplane in flight. Lift pulls plane up, weight pulls it down. Propeller thrust pulls plane forward, drag of plane through air holds it back.

a radiator, a radio mast. It needs a landing gear, perhaps struts and wires to stiffen the wings. It needs tail fins.

Each of these parts causes a drag. It takes definite force to push each of them through the air, for the air, sticky dense stuff, resists their passage. But unlike the drag of the wings, drag of these parts is not associated with the making of lift. It is pure evil. It is useless and bears the contemptuous name of parasite drag.

## Shape reduces drag

The airplane is shaped to keep parasite drag small. Hence, that sharklike look—sharks, too, are shaped to move through a dense fluid fast. And hence all the little things that aren't there. The most remarkable thing about a modern airplane is what you *don't* see, and what in older airplanes you used to see. The engine is hidden under a smooth cowl, pilot and passengers are inside, the landing gear is tucked away in flight, the wings stick out without any struts and wires. Just as those things are out of your sight, so they are out of the way of the air and can cause no drag. The dream ship of aeronautical engineers is the Flying Wing, the all-wing airplane that hasn't even a fuselage any more. Everything has been pulled into the wing, and the wing is all there is.

Those then, as every student pilot learns, are the four forces that act on an airplane in flight: 1) weight pulls it down, but 2) lift of its wing holds it up; 3) drag holds it back, but 4) pull of the propeller keeps it going. In steady flight, the four forces balance and all is serene.

So wonderfully is the airplane shaped that in flight it will largely take care of itself. It always wants to do the right thing, whatever is necessary to keep itself flying. Many people think that piloting is a balancing stunt, much like walking a tightrope. Actually, the art of piloting consists of about nine-tenths of doing nothing and trusting the airplane. Many people think that on the slightest lapse of the pilot's attention an airplane will go into a spin. Actually, a stall or a spin is brought on only by heavy misuse of the controls. Generally speaking, an airplane left to itself does not want to drop, it wants to fly. A careless pilot sometimes leaves his airplane standing on the airport with the engine idling while he goes for a cup of coffee—and it has happened that such an airplane has run away, taken off and flown itself, pilotless, for a couple of hours.

This uncanny stability is simply a matter of shape. Whenever anything is wrong, the airplane by that very fact presents a different side of itself to the onrushing air. Since its shape is designed with just that idea in mind, the air will create on the new shape a new force, and the new force rights the airplane.

One such stabilizing shape is the vertical fin on the tail. If a gust turns the airplane crosswise to its line of flight so that it begins to move in the manner of a skidding car, the vertical fin thereby is turned broadside to the onrushing air and the tail is blown right back where it belongs.

Another such stabilizing refinement of shape is the dihedral angle, that V-like uptilt of the wings as viewed from in front. Let a gust of air try to capsize the airplane, say to the left. The moment it begins to slide off sidewise, the air begins to blow harder against its left side because the designer has tilted the wings at that angle. The air immediately lifts harder on the left wing, less hard on the right wing, and the airplane tries to right itself.

Of all the things that a well-shaped airplane will do, the cleverest is the way it keeps itself going forward, maintains that all-important speed. Suppose that the engine should suddenly quit. If the airplane then wanted to stop it would be dangerous, for without speed there can be no lift, and the airplane would stall or spin. But the airplane does not want to stop. It wants to keep going. It noses down slightly and thus coasting maintains its speed. The shapes that do this are two horizontal planes on the tail. At first glance, they look like a pair of little wings holding up the small end of the fuselage while the big wings hold up the big end. Actually these horizontal stabilizers hold the tail down. They do so partly because of the angle at which they are set and partly because they are always flying in the down-wash of the air that comes from the wings. The wings themselves are set on the fuselage fairly far back so that the airplane is always a little nose-heavy and always wants to go into a dive; and the only thing that keeps the airplane out of that dive is the down force on the tail planes.

Even the airplane's controls work by shape. When the pilot presses against stick or pedals, what he really does thereby is to bend his airplane's wings and tail out of shape. Then the air, hitting the new shape, creates a new force that makes the nose go up or down, or swings it right or left, or banks the wings.

Because they work by shape, by the impact of flowing air on shape, an airplane's controls are not mechanical and positive like a car's, but fluid and soft; and they are full of little tricks. As every flying cadet soon finds out, smooth accurate control of an airplane is quite an art. The feel and the effectiveness of each control varies according to the airplane's speed. In fast flight, they feel firm and stiff and the airplane responds promptly. In a slow glide, they feel soft and "mushy" and the airplane is slow to respond. In a stall, the stick feels dead as if it were disconnected. And always, each control produces not only the desired main effect, but all sorts of annoying little by-effects as well. Each time the pilot uses one control he thus must make small corrections also with some other control.

Among expert pilots, simply to fly straight and level through jumpy air and flowing winds is considered one of the most telling tests of a man's flying ability. The airplane that moves in a long straight line across your sky does so not by its own will, but because a skilled pilot keeps it flying straight by a finely co-ordinated play of his controls, making small, almost imperceptible changes in his airplane's shape, that are much like the small steadying motions of the tail and the wing of the sea gull as it soars.

# AGANO IS NEWEST JAP LIGHT CRUISER

Graceful, modern in outline, with a single raked stack, the new Agano Class CL carries on the distinct Jap trend away from their old-fashioned multi-stacked type of CL. Available data is tentative, but the estimated displacement of 6,000 tons makes the Agano the largest Japanese light cruiser thus far. With a main battery of six 6.1-in. guns, and two 4-in. or 4.7-in. guns in dual-purpose mounts, the Agano is obsolescent in firepower, though somewhat more heavily armed than earlier Jap CL's. Older classes, criticized as underarmed, had four to seven 5.5-in. and two or three 3-in. AA guns. A main battery disposition of two twin turrets forward, one aft, distinguishes the Agano from single-stack CA's of the Tone and Mogami Classes.

The Agano is protected against air attack by 14 or more light AA guns, and carries at least four torpedo tubes, half the number mounted by Kuma, Natori and Sendai Classes. Such changes indicate the Japs have not exhausted their ingenuity, and are presumably busy sending new ships down the ways.

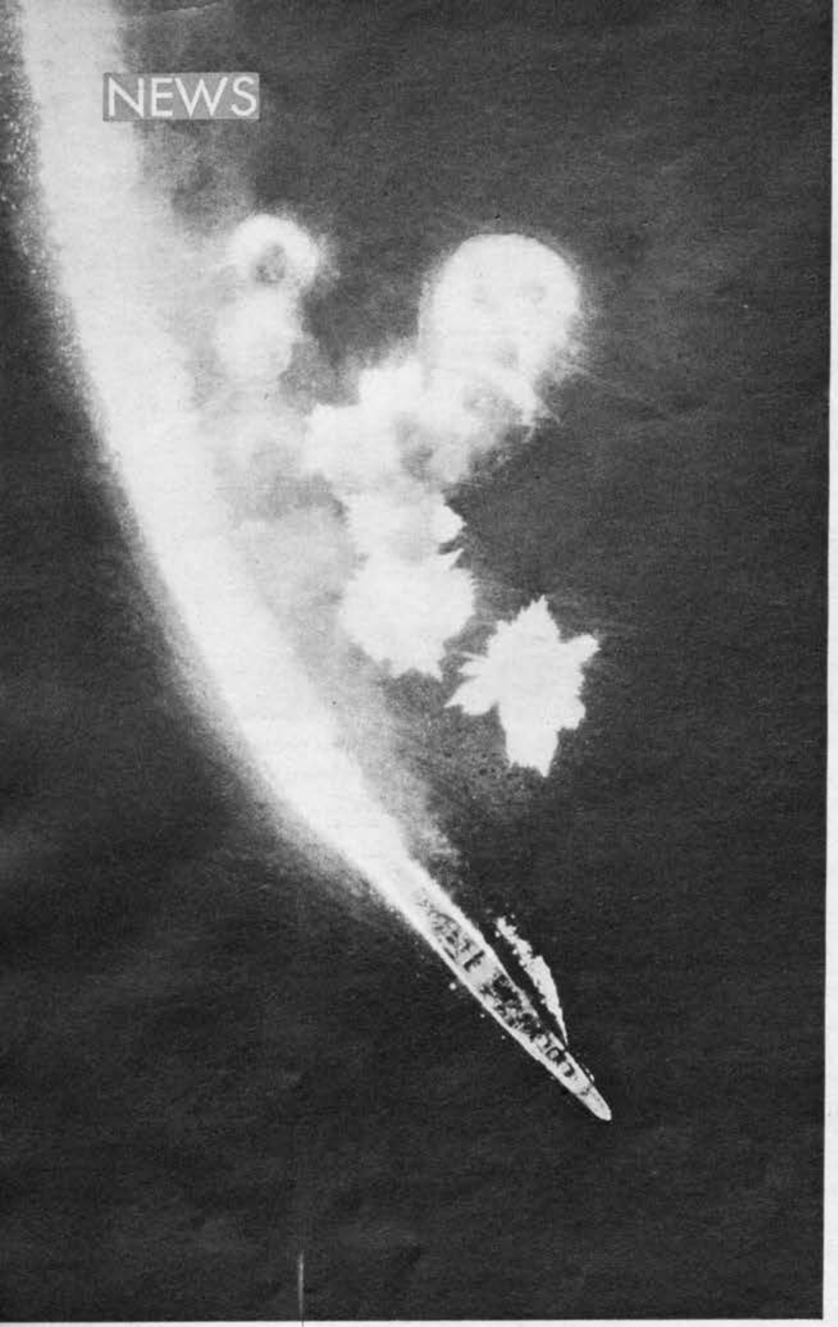
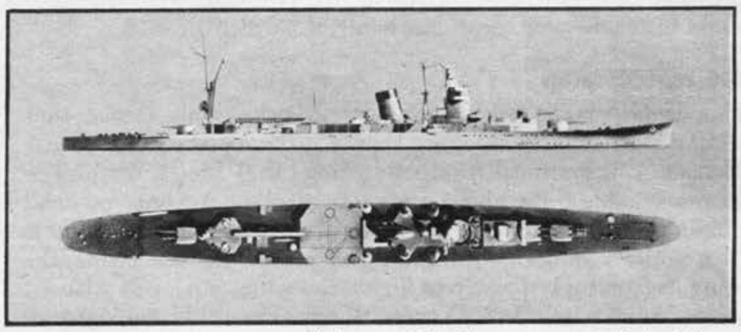
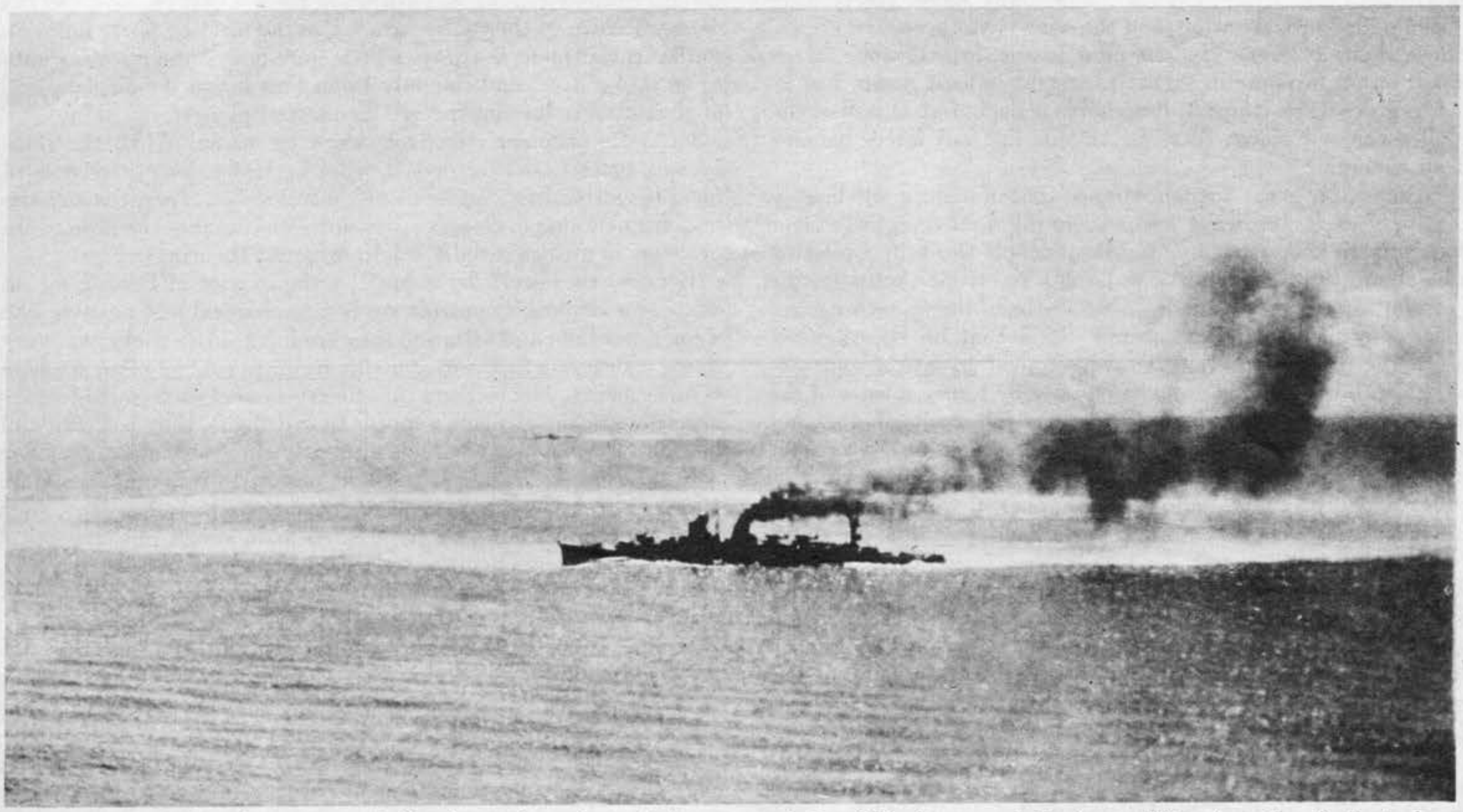


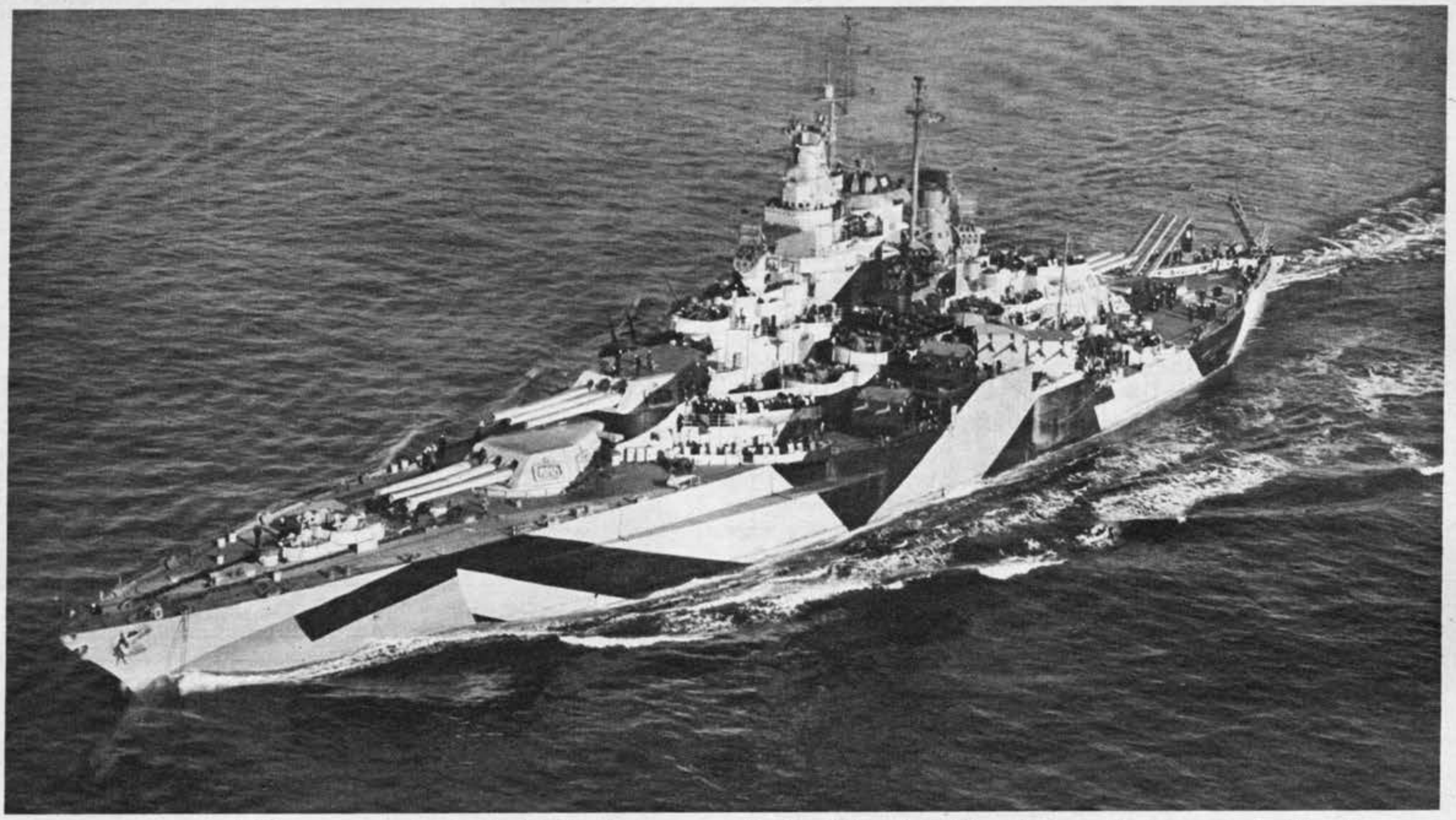
**PHOTO TAKEN NEAR RABAUL** by U. S. Army fliers shows Agano's prominent aircraft stowage deck abaft stack and heavy main mast crane well aft.



**BEAM AND OVERHEAD VIEWS** of Agano (*above*) were prepared by Identification and Characteristics Section, Division of Naval Intelligence.



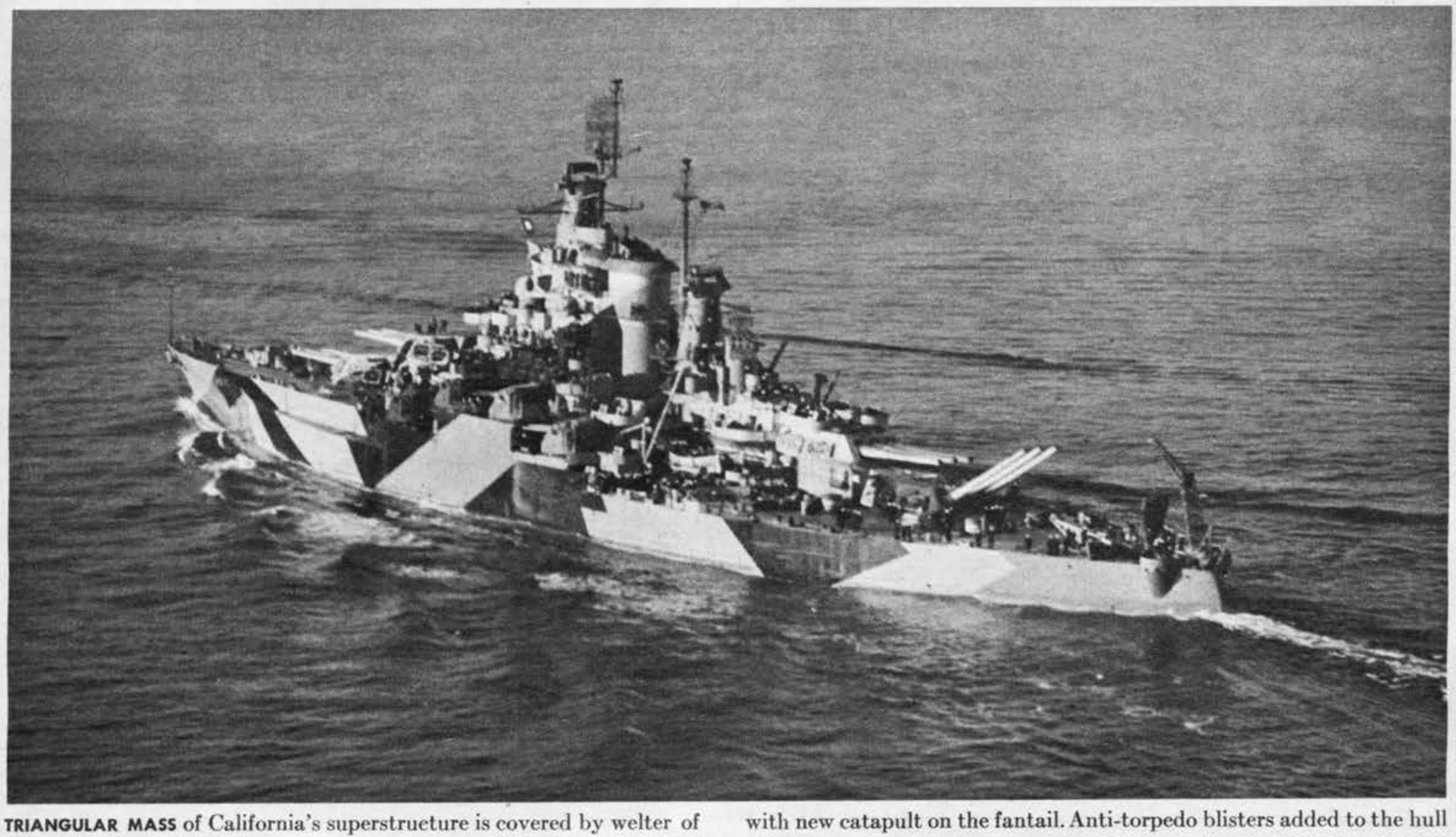
**TWO OR THREE JAKE** floatplanes are carried by Agano, here shown during an attack near Kavieng. Agano, Yubari and Katori are the only single-stack Jap CL's. In general, the Agano differs from Jap single-stackers of CA, CL, DD classes in its slender stack, spread-out superstructure.



**REFITTED CALIFORNIA** looks like a very modern battleship, having a pronounced resemblance to the crack South Dakota Class ships. Pre-Pearl Harbor California had two stacks and twin cage masts. These have now been replaced by single stack, tower foremast and stump pole mainmast.

# U.S.S. CALIFORNIA REJOINS FLEET

With the return to action of the refitted California, the Tennessee Class is completed. These two ships were originally ordered in late 1915 and were typical early post-World War I battleships (see *Journal*, Sept. issue). Both were hit at Pearl Harbor and both have been almost completely remade. The superstructure has been modernized, all fire-room uptakes concentrated in one stack, and original rig replaced. A new secondary battery consisting of eight twin mounts has replaced the old casemate guns, but the main battery remains in four triple turrets.

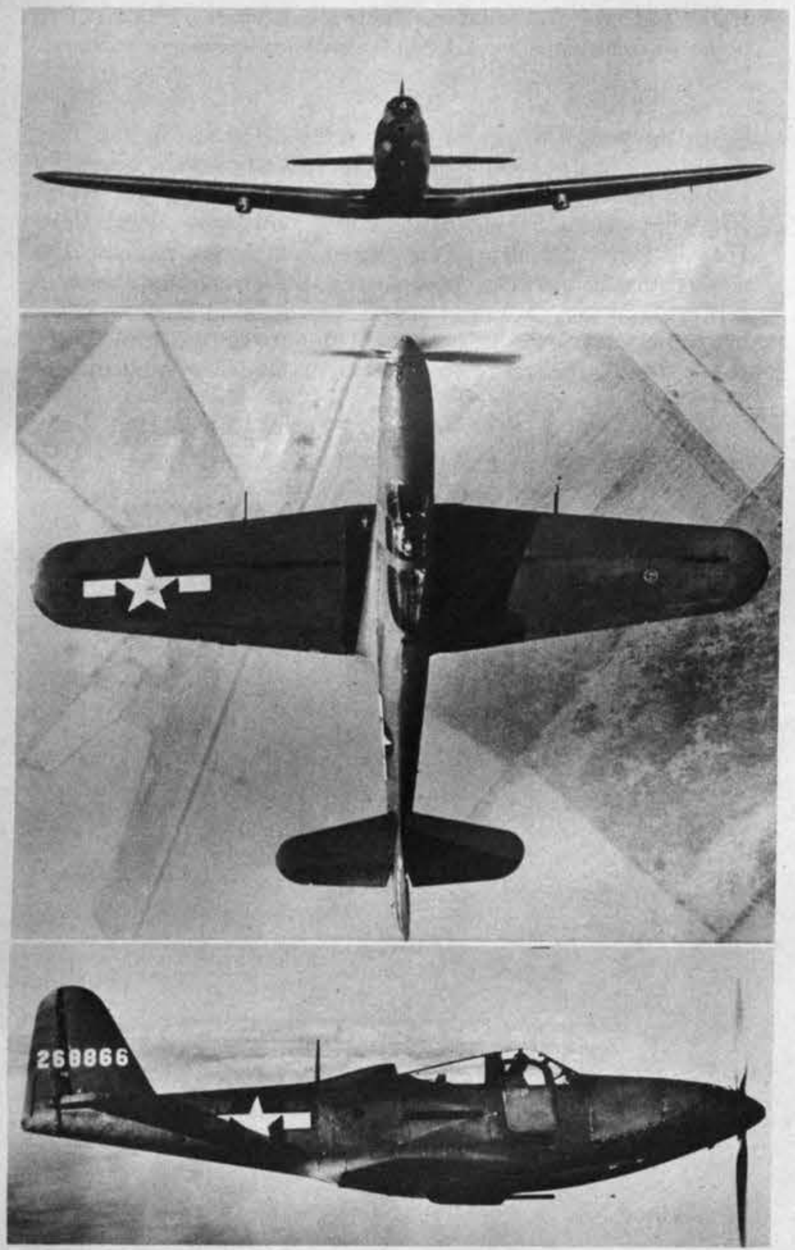


**TRIANGULAR MASS** of California's superstructure is covered by welter of light AA. Catapult has been removed from top of No. 3 turret, paired with new catapult on the fantail. Anti-torpedo blisters added to the hull give Class exceptional beam, make ships easy to recognize from the air.

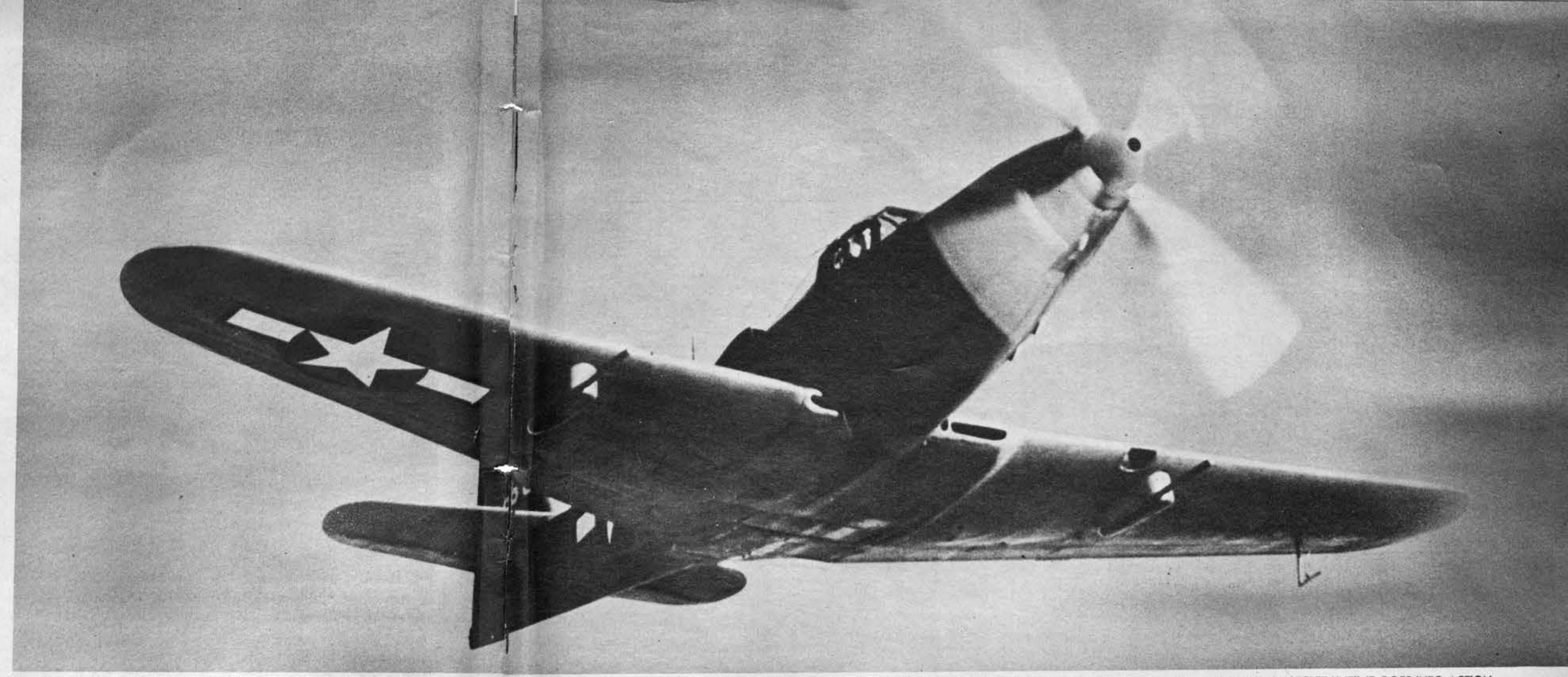
# NEW ARMY FIGHTER IS IMPROVED P-39

In the new P-63A Kingcobra the Army Air Forces have a greatly improved version of the reliable old P-39 Airacobra. The chief improvements are in the faster rate of climb and higher ceiling. The P-63 keeps all the P-39's good features: the hub-firing cannon, the rear-mounted engine, the fine forward visibility. The main changes have been in the power plant and the wing. The P-63 has an Allison V-1710 inline engine with improved supercharger and a four-bladed propeller to handle the increased horsepower. This has required a slight increase in the overall size of the plane: Span is increased from 34 ft. to 38 ft.; length from 30 ft. to 32 ft., 8 in.

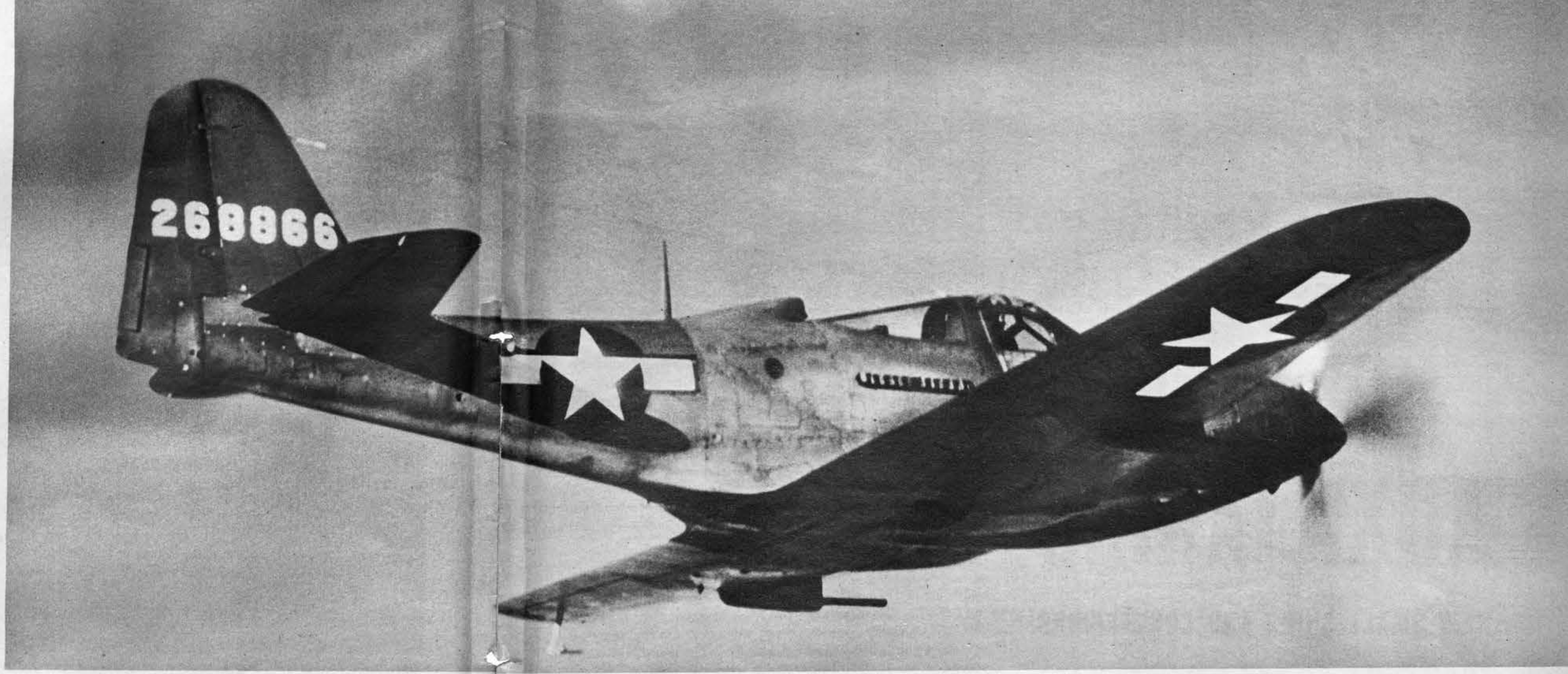
The wing of the P-63 has a slightly different shape than that of the P-39. The P-63's wing tapers equally on both edges to rounded tips. The dihedral of the P-63's wing is as pronounced as on the P-39 but it starts slightly outboard of the wing root. The tailplane of the P-63 is set forward of the rudder. The fin and rudder is tall with rounded top and more taper on its straight leading edge.



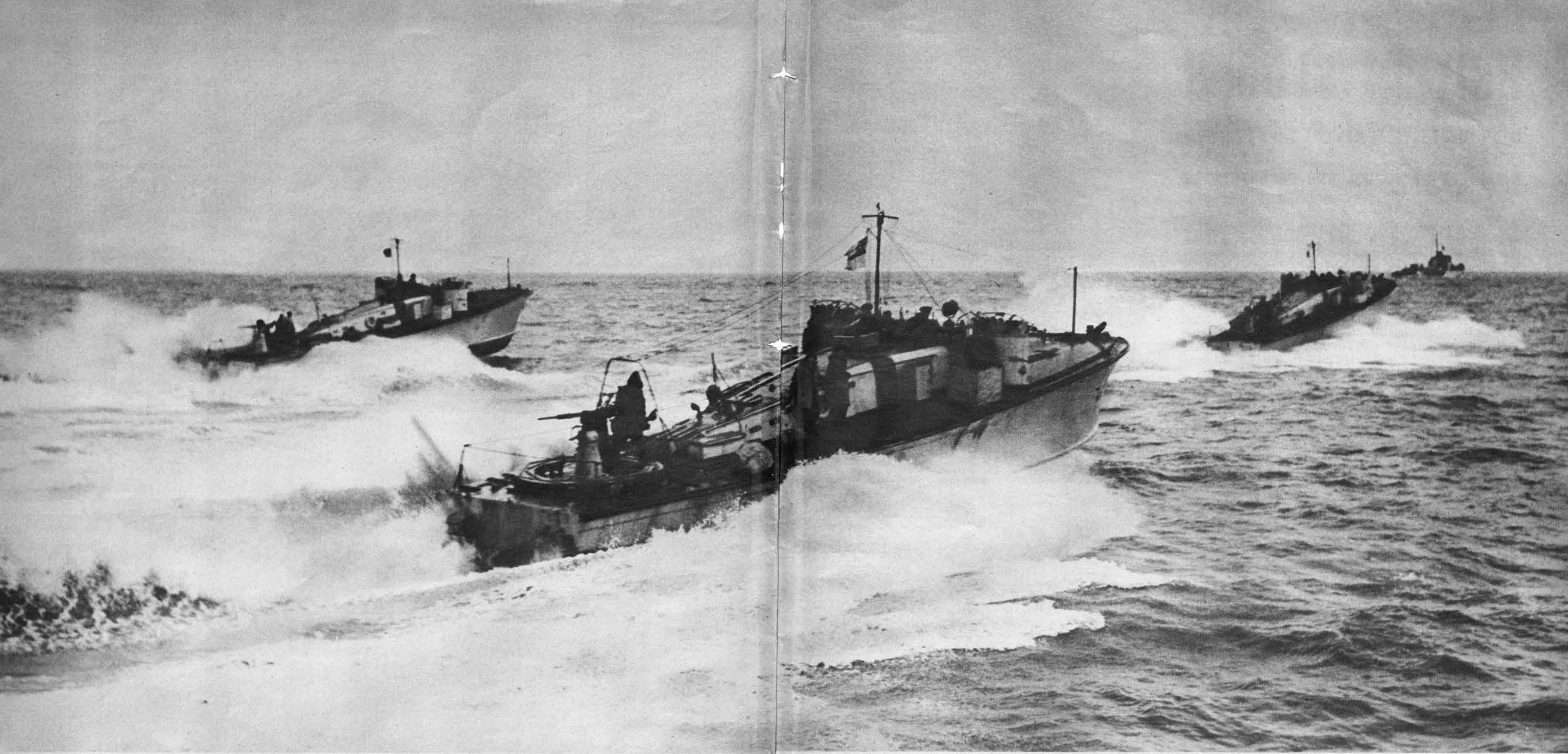
**MARKED SIMILARITY** of P-63 to P-39 is shown by three silhouette views above. Chief recognition changes have been in wing plan, and fin and rudder. New plane retains the long pointed nose and wing set toward middle of fuselage.



THE NEW BELL FIGHTER, LIKE ITS PREDECESSOR, IS DESIGNED TO FIGHT AT MEDIUM ALTITUDES. SERVICE CEILING IS ABOUT 35,000 FT. AND TOP SPEED IS REPORTED TO BE AROUND 400 M.P.H. ARMAMENT MUST REMAIN SECRET UNTIL IT GOES INTO ACTION



MANY CONSTRUCTION DETAILS WHICH HELPED IDENTIFY P-39 HAVE BEEN CARRIED OVER TO THE P-63. AMONG THEM ARE THE DISTINCTIVE AIR INTAKE BEHIND THE HUMPED COCKPIT, AUTOMOBILE-TYPE DOOR, EXHAUST OUTLETS ON SIDES OF FUSELAGE



MOTOR GUNBOATS OF THE ROYAL NAVY TURN BACK TOWARD THEIR BRITISH BASE AFTER A RAID ON A GERMAN COASTAL CONVOY. THESE SMALL BOATS ARE TYPICAL OF BRITAIN'S COASTAL FLEET. BUILT IN QUANTITY TO STANDARD DESIGNS, THEY FIGHT CLOSE TO HOME, DEFEND OUR OWN CHANNEL CONVOYS, ATTACK THE ENEMY'S

# BRITISH AUXILIARIES

## NEW SMALL SHIPS AND CONVERSIONS FORM BULK OF THE BRITISH FLEET

A sturdy corvette rolling through the North Atlantic, a fast motor torpedo boat sweeping across the Channel, a minesweeper towing its paravanes up the coast of Scotland typifies the Royal Navy as much as the Duke of York slugging it out with the Scharnhorst. The Royal Navy is a unit, with capital ships giving strategic support to a myriad of small ships—destroyers, sloops, frigates, corvettes, minesweepers, minelayers, gunboats, monitors, trawlers. The minor fighting ships keep sea lanes open to the island kingdom, help speed the flow of the great stock of supplies to the United Nations' greatest base, support offensive action of fleet units.

The nature of the naval warfare in the European theater minimized the tactical importance of the battleship and increased the functions of the smaller ships. Though Germany's between-wars shipbuilding program was widely publicized, the end result was not a first-class sea power. It was, however, a very dangerous fleet of anti-shipping raiders of many types. Therefore it was not only necessary for Britain to maintain a heavily gunned fleet in home waters, but greatly to expand her patrol and escort fleet. Besides the German threat, other factors operated to make a large small-boat fleet imperative. England lives by her sea communications and the defense of them extended around the globe. With her war fronts stretched from Hong Kong to Nova Scotia, large expeditionary forces required transport and supply. And as the offensive swung to the Allies, amphibious attacks on hostile island outposts and beaches required the support of bombardment craft.

Because of their widespread tasks and their low individual fighting power, the strength of these small boats lies in their numbers. If they cannot swarm over the enemy and meet him at every turn, they can easily be blasted or avoided. For this reason, the early part of the war saw the Royal Navy turning to an extensive conversion program. Suitable hulls that were not being used for cargo space or fighting ships were drawn into the auxiliary navy. Side-wheeler river steamers became auxiliary antiaircraft ships. Big, fast passenger liners were transformed into armed merchant cruisers like the gallant Jervis Bay and Rawalpindi. Trawlers and drifters were put to work sweeping mines, tending submarine nets and booms, searching coastal waters for lurking U-boats. All the resources of the greatest maritime nation were quickly turned to important war uses.

As the war lengthened, specially designed small ships came into use and the less efficient conversions faded from action. In the U. S. A. various types of submarine chasers went into production. In England a parallel development produced the sloop, frigate and corvette as the major patrol and escort vessels. Also developed were standard types of minesweepers, minelayers and trawlers. These ships are easy to build and have been designed with mass production in mind which has resulted in a marked similarity of appearance among them all. The hulls have simple lines, most having high freeboard forward and low quarterdecks. Bridge structure is a simple blockhouse, a diminutive reproduction of British battleship style. The single stacks are just forward of amidships. This great similarity among a wide variety of ships has extremely important implications for recognition. Though it makes somewhat easier the determination of a ship's nationality, it also makes the identification of the type and purpose of the ship very difficult. The only final solution is for the serviceman to know his ships thoroughly.

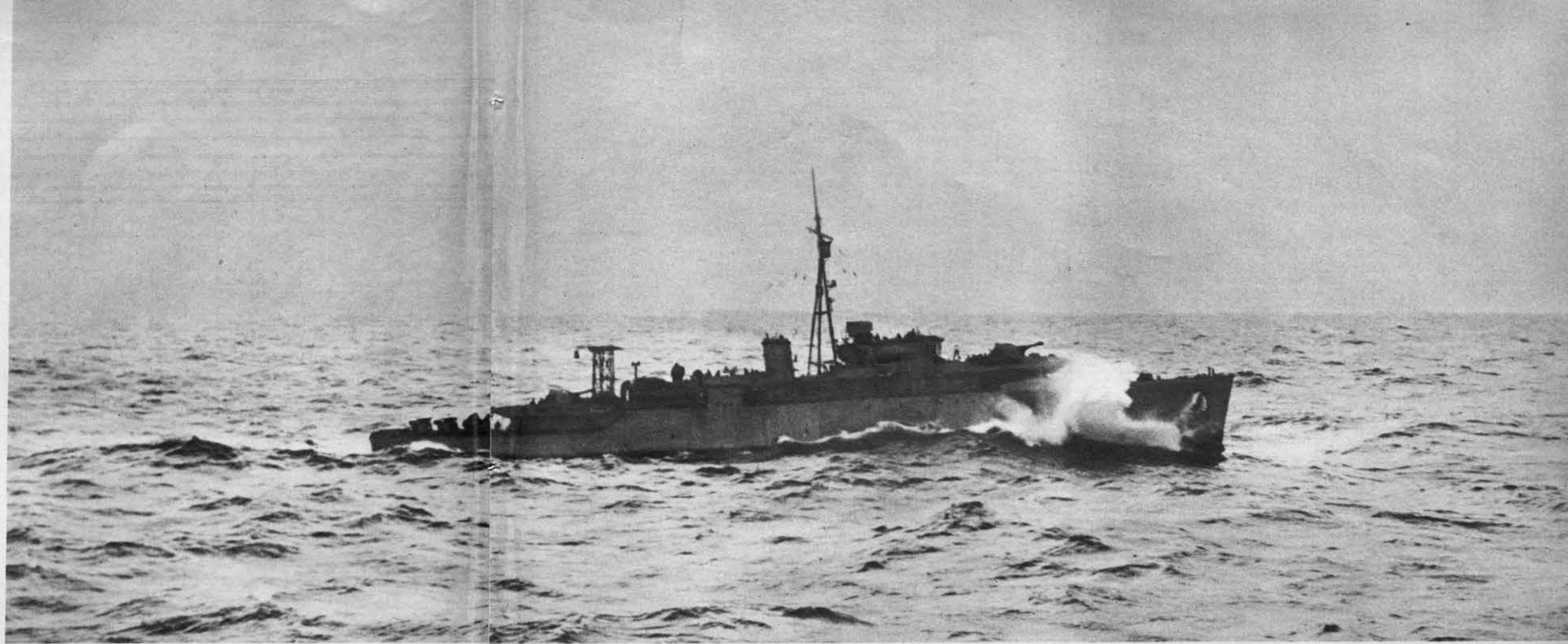
# BRITISH SLOOPS

## WITH INCREASED ARMAMENT THEY PERFORM A VARIETY OF PATROL AND ESCORT TASKS

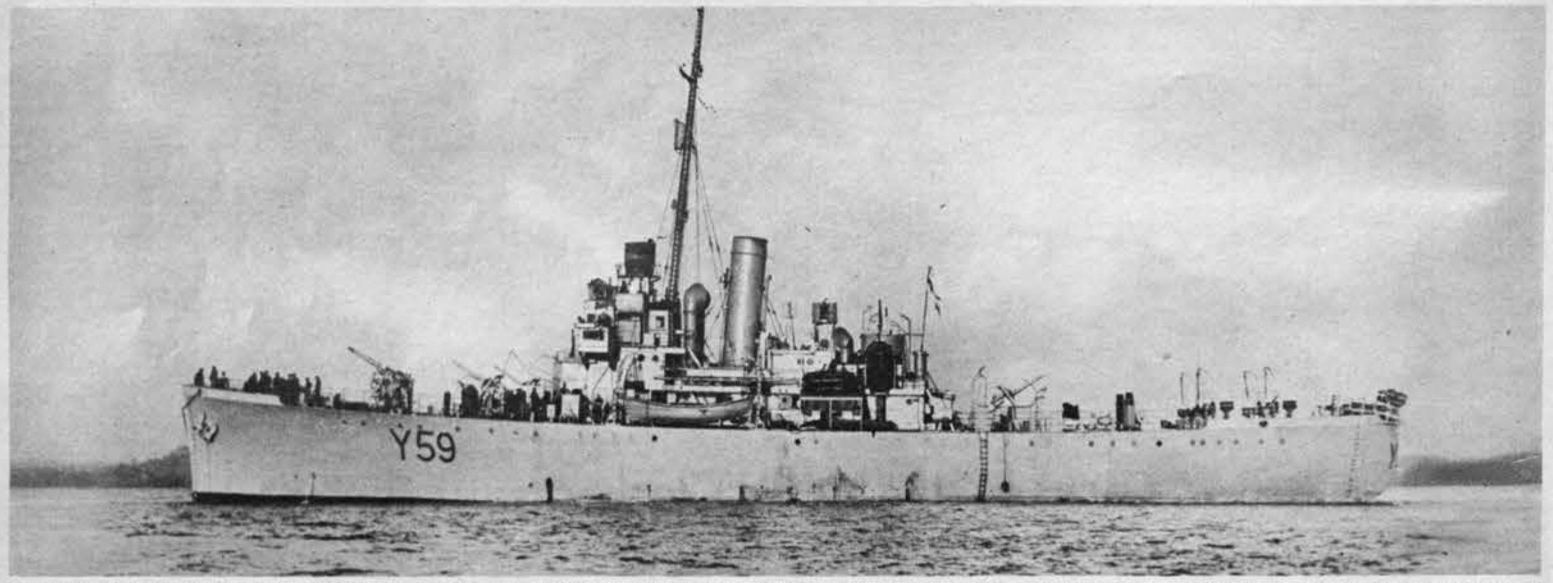
Corresponding to gunboats and Coast Guard cutters in the U. S. Navy, British sloops are among the most versatile of the Royal Navy's minor combatant craft. They serve as escort vessels with convoys, speed away to chase submarines, serve as antiaircraft ships and do general ocean patrol work. In an emergency they could be used as minesweepers.

In fact, the Bridgewater Class sloops, first ones built since World War I, were originally fitted for minesweeping. Their design set the pattern for all subsequent sloop construction even though they appear frail when compared to the sturdy units of the new Bittern and Black Swan Classes.

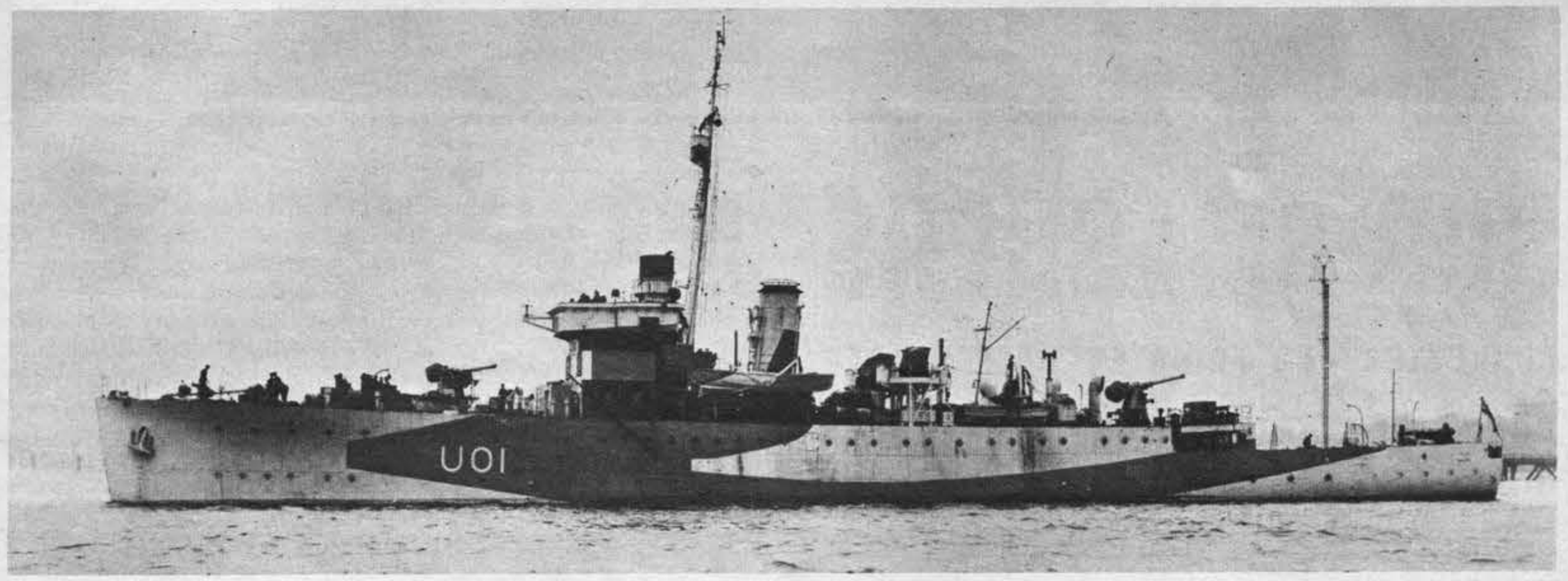
Although sloops are completely outclassed by destroyers in speed, they approach the newest destroyers in armament. Some have as many as eight dual-purpose guns in twin mounts. Each succeeding class of sloops has so far had heavier gun armament than the preceding one, showing a trend counter to that prevailing among other patrol and escort types where the emphasis has been on depth-charge equipment and light antiaircraft weapons.



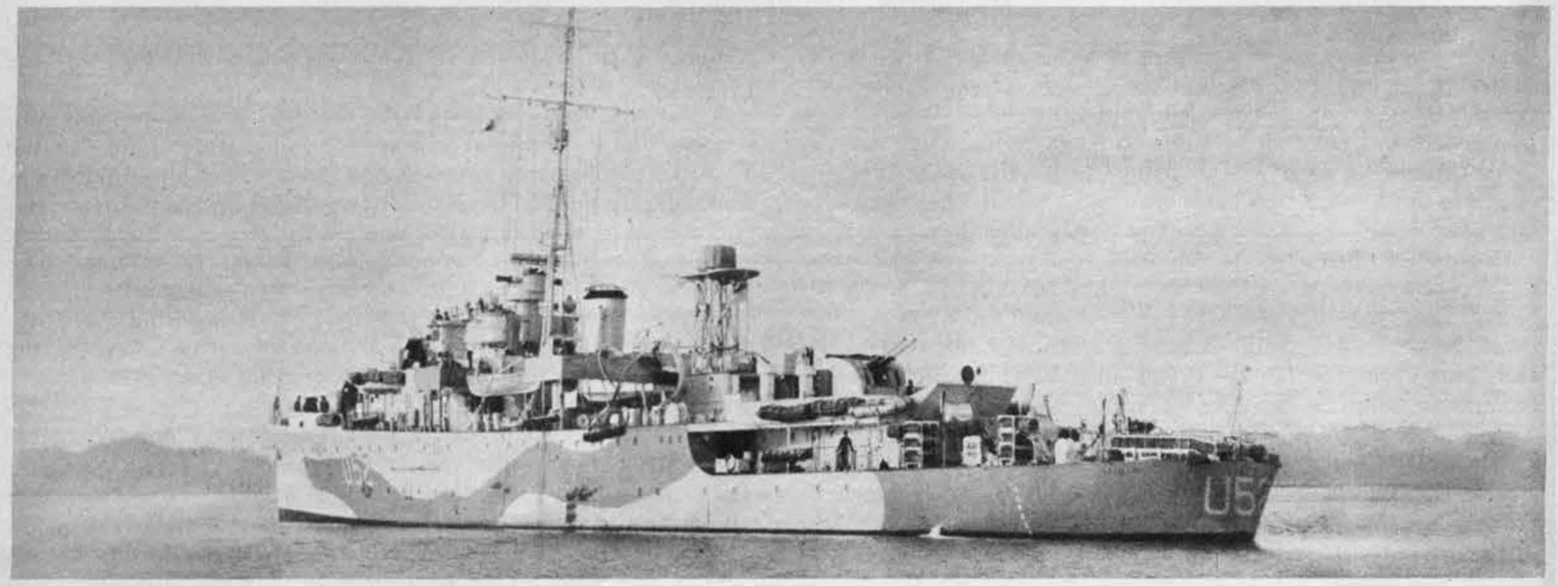
H.M.S. KITE OF MODIFIED BLACK SWAN CLASS IS AN EXAMPLE OF MOST RECENT DESIGN IN BRITISH SLOOPS. TRESTLE TOWER AFT, TRIPOD FOREMAST, LOW BRIDGE ARE IMPORTANT RECOGNITION FEATURES. STACK APPEARS UNUSUALLY SMALL



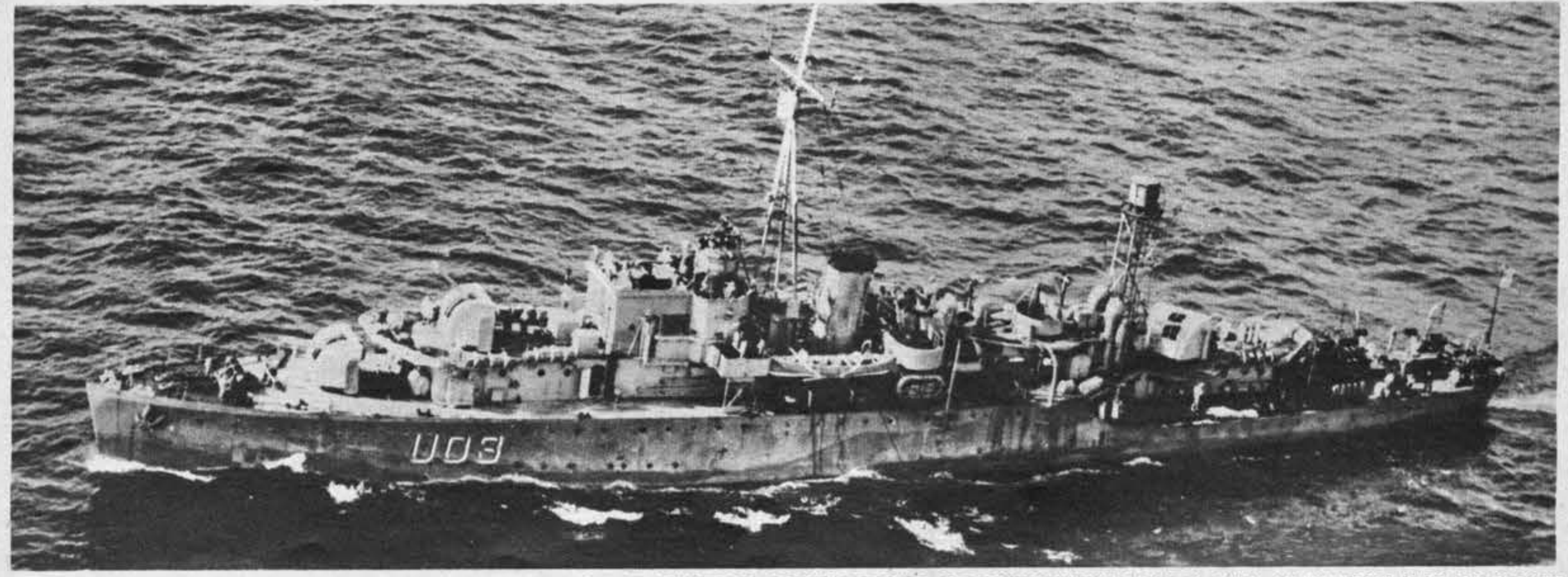
LULWORTH CLASS SLOOP, H.M.S. FISHGUARD, WAS U. S. COAST GUARD CUTTER TAHOE. FLUSHDECK HULL AND TALL THIN STACK ARE CHARACTERISTIC OF CLASS



PATTERN FOR LATER SLOOPS WAS SET BY H.M.S. BRIDGEWATER. COMPARED TO LATER DESIGNS, BRIDGEWATER HAS TALLER STACK, LESS SUPERSTRUCTURE



H.M.S. GODAVARI OF ROYAL INDIAN NAVY BELONGS TO MODIFIED BITTERN CLASS, IS AMONG FIRST CLASSES TO HAVE TWIN MOUNTS, SHORT STACK, LOWER BRIDGE



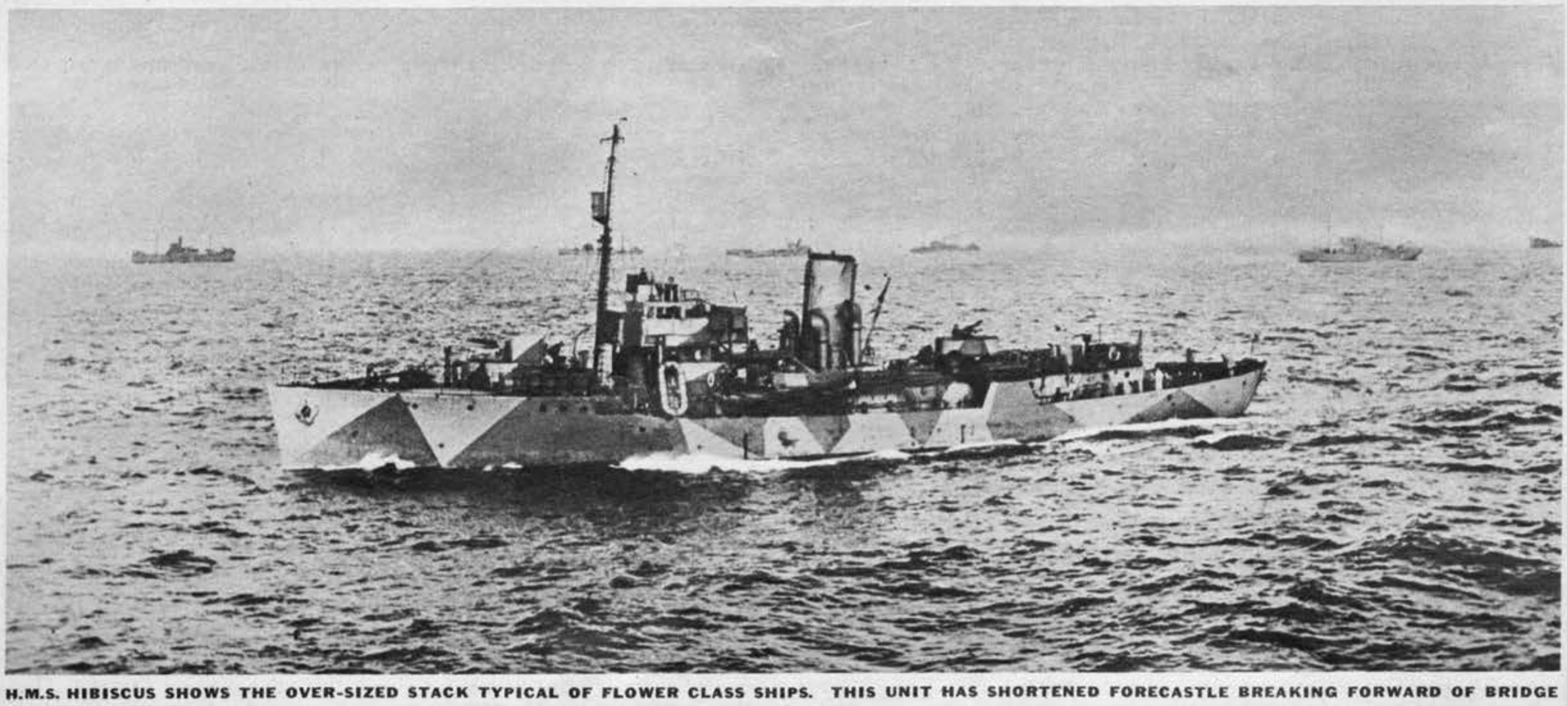
AERIAL VIEW OF BLACK SWAN SLOOP SHOWS CLUTTERED DECK OF NEW TYPES. TRESTLE TOWER AFT DISTINGUISHES BLACK SWAN CLASS FROM EARLIER SLOOPS

FLOWER CLASS CORVETTES WERE FIRST MASS-PRODUCED ANTI-SUB SHIPS OF THIS WAR. SPEED, GUNPOWER WERE SACRIFICED FOR SAKE OF DEPTH-CHARGE GEAR

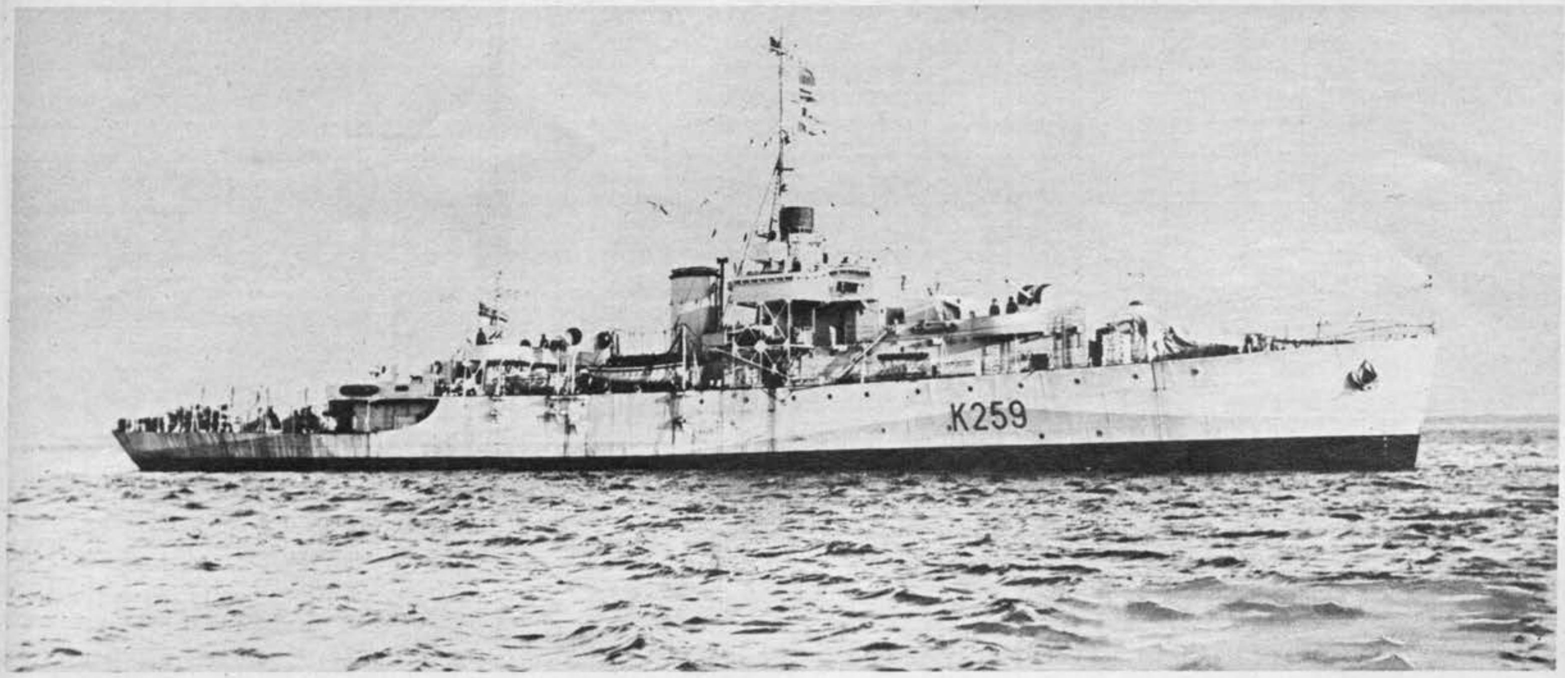
# SUB SMASHERS

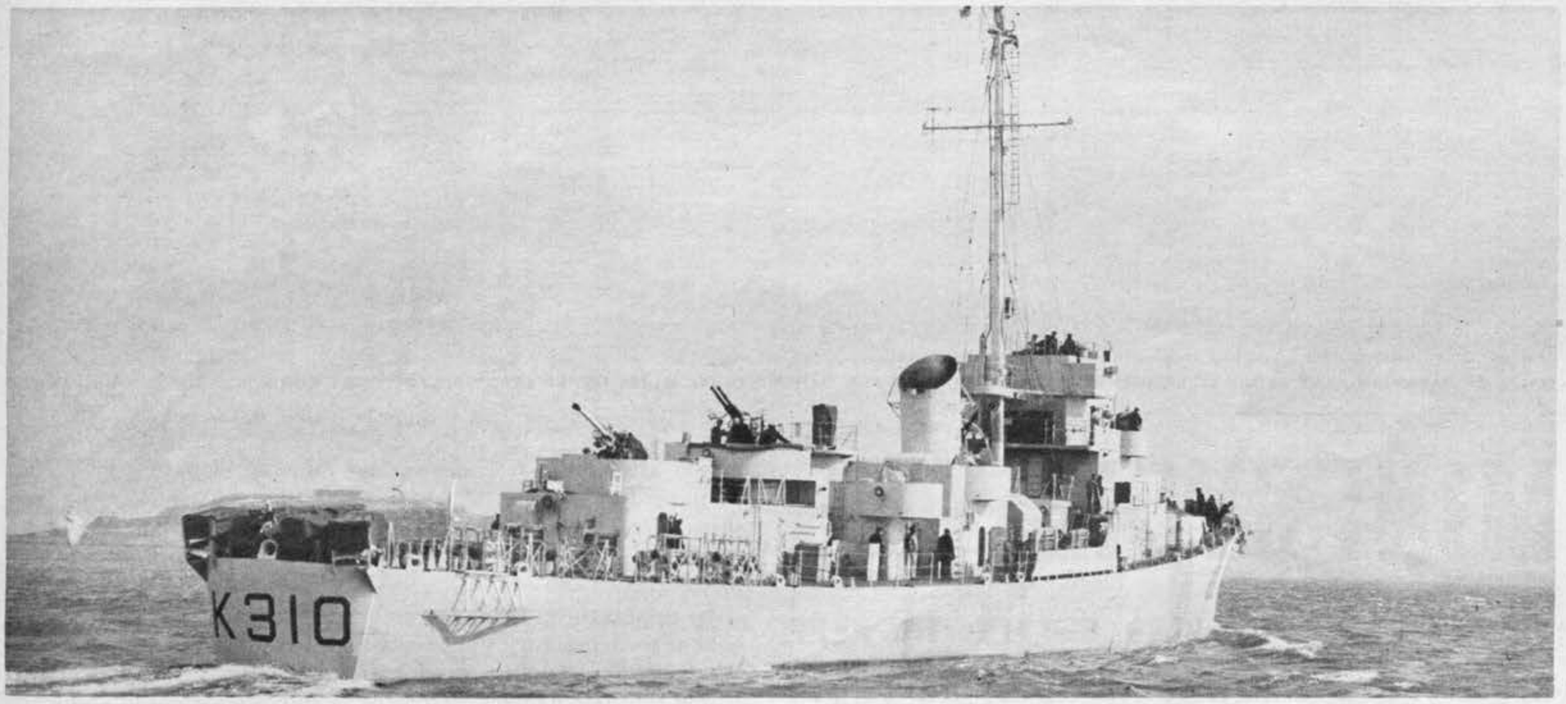
## CORVETTES AND FRIGATES HAVE SHARED BRUNT OF NORTH ATLANTIC STRUGGLE

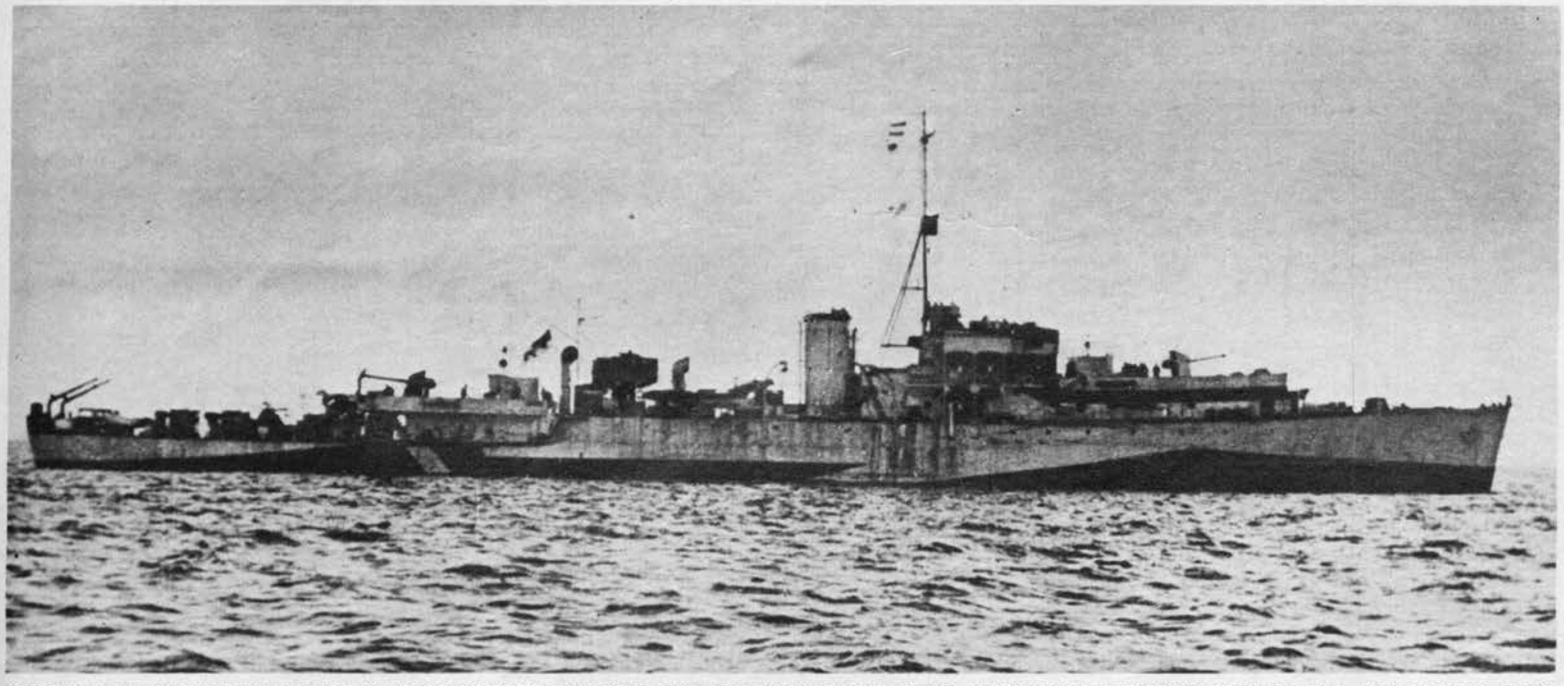
Built to reinforce Britain's hard-pressed destroyer fleet, corvettes have been credited with turning the tide in the Battle of the Atlantic when Allied losses neared the critical stage. The needs of quick mass production governed the design of the Flower Class which makes up the big corvette fleet built after war broke out. Evolved from the Flower Class were the ships of the River Class, at first called corvettes, later re-rated as frigates. A return to destroyer lines, greater dimensions with little increase in tonnage have combined to make the frigate a great improvement over the corvette.

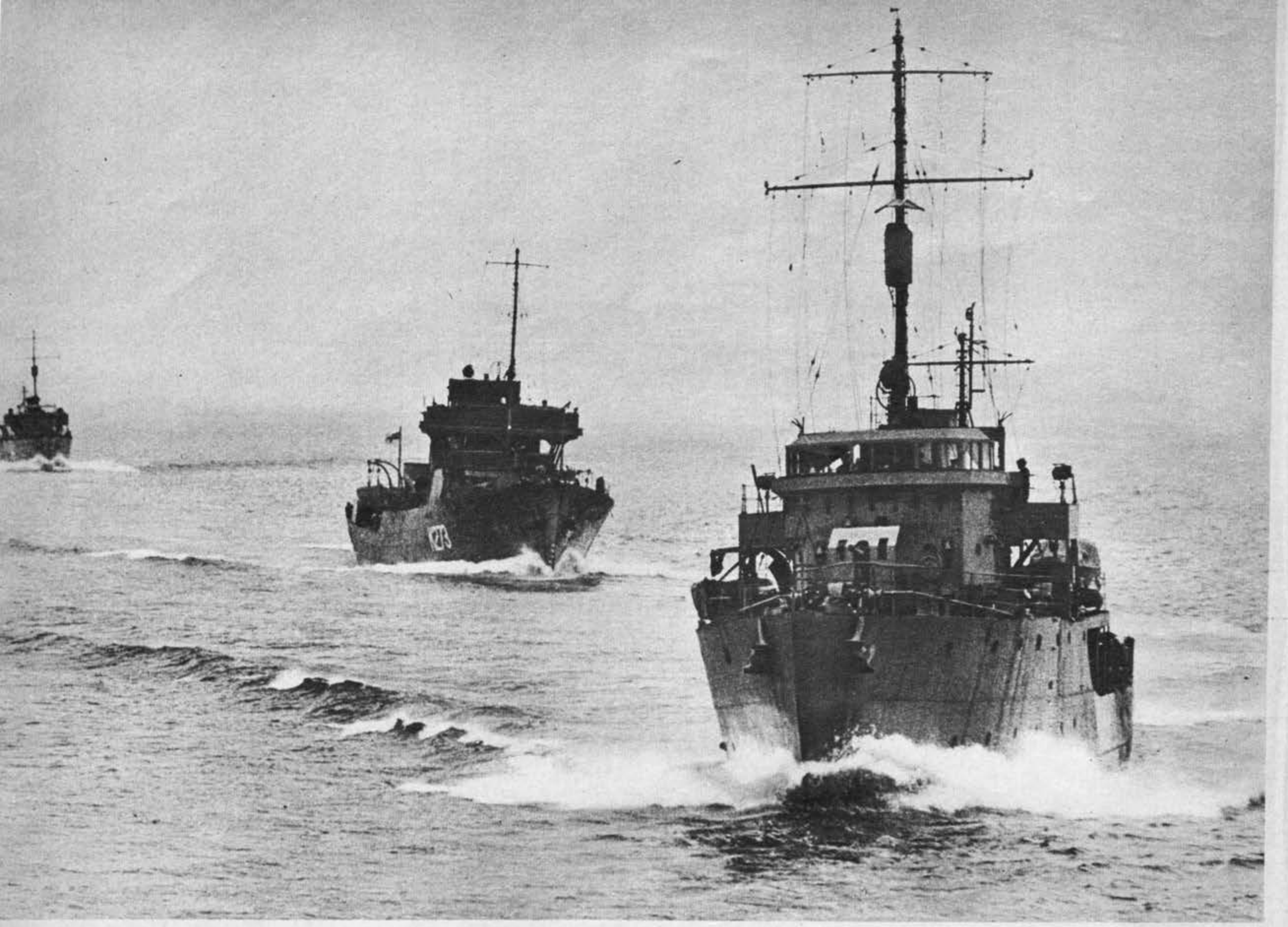


H.M.S. HIBISCUS SHOWS THE OVER-SIZED STACK TYPICAL OF FLOWER CLASS SHIPS. THIS UNIT HAS SHORTENED FORECASTLE BREAKING FORWARD OF BRIDGE


SLEEK LINES OF RIVER CLASS FRIGATE, CONTRAST WITH THOSE OF STUBBIER CORVETTE (LEFT). NOTE LONG DECKHOUSE FORWARD AND DECKLINE BREAK AFT


H.M.S. BAYNTUN OF CAPTAIN CLASS IS SHORT-HULL DESTROYER ESCORT. IDENTICAL WITH THOSE BUILT FOR THE U. S. NAVY, IT WAS LEND-LEASED TO BRITISH


WIDE FANTAIL, LOW UPRIGHT STACK CLOSE TO BRIDGE CHARACTERIZE RIVER FRIGATE, H.M.S. NESS. SLIGHTLY MODIFIED VERSION IS BEING ADDED TO U. S. FLEET



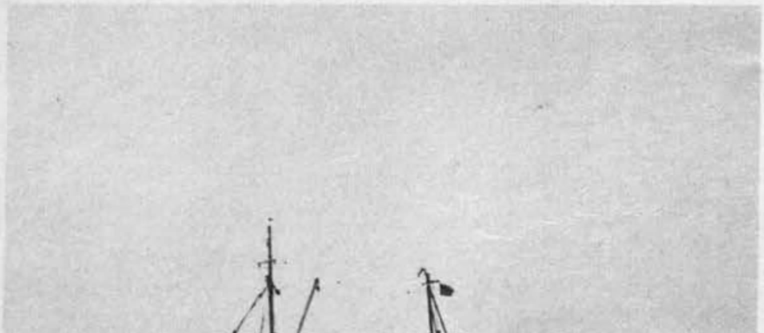
UNITS OF CANADIAN NAVY SCOUR ST. LAWRENCE ESTUARY HUNTING SUB. BANGOR CLASS MINESWEEPER LEADS, FOLLOWED BY CORVETTE AND SECOND BANGOR

# MINESWEEPERS

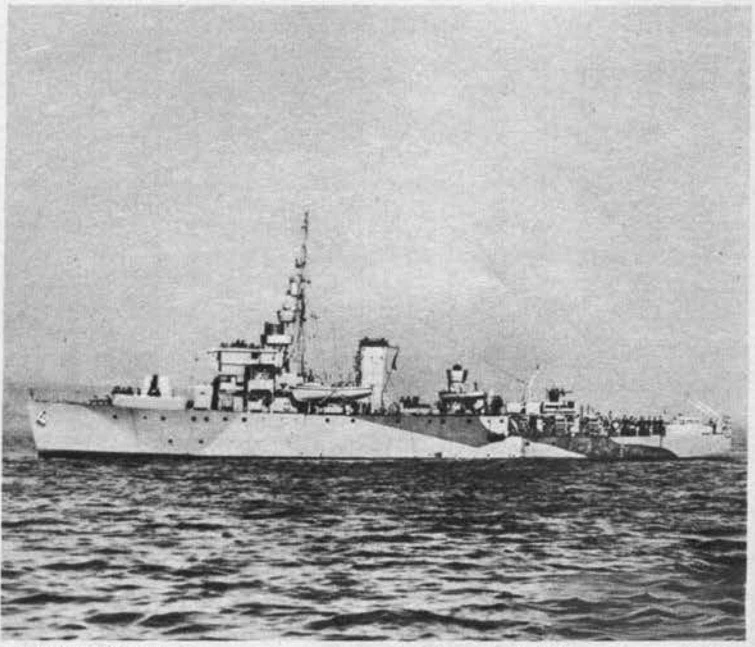
## THEY FIGHT UNCEASING BATTLE TO KEEP OPEN THE SEA LANES OFF BRITISH PORTS

Night after night German surface minelayers, subs, and planes mine English coastal waters near the great harbors to trap ships in from the Atlantic. As regularly as they are laid, the mines must be swept up by converted trawlers and regular minesweepers of the Royal Navy.

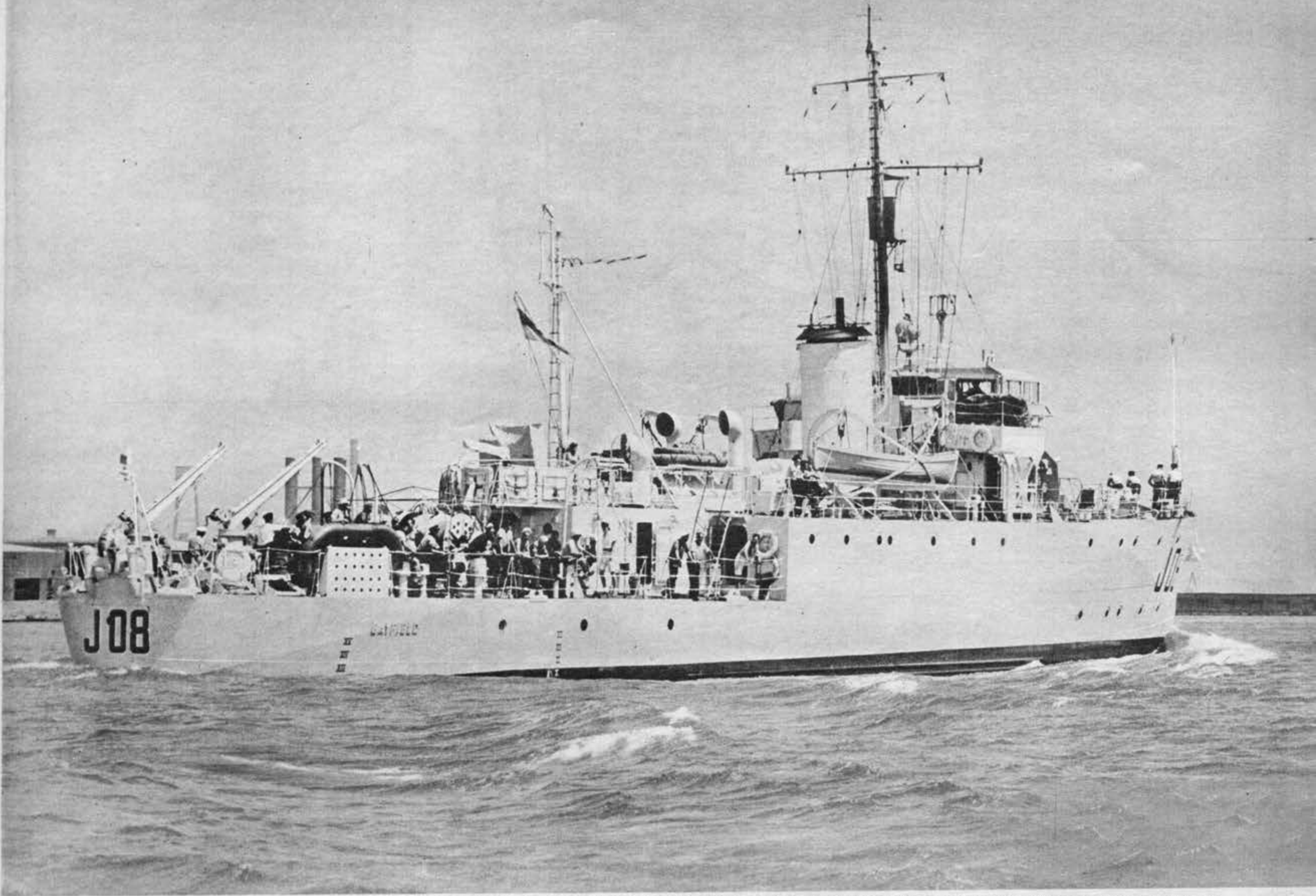
In appearance, British minesweeper design generally follows that of contemporary sloops although the minesweepers are somewhat smaller. As sturdy sea-going craft, they are not confined to the dull but dangerous routine of mine-hunting but frequent-



**MOTOR MINESWEEPER,** plowing through coastal waters, is typical of conversions from small commercial vessels taken by Admiralty for war service.



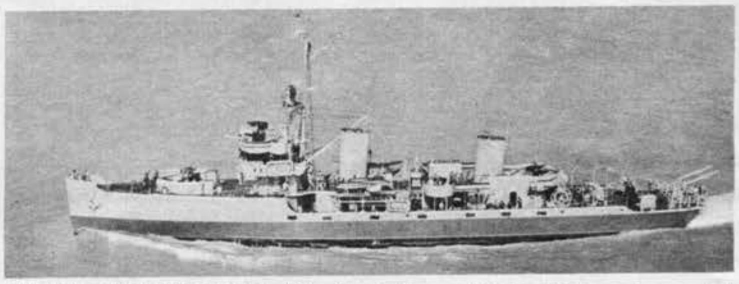
**ALGERINE CLASS** sweepers are improved Halcyons (*right*) and can be distinguished by fuller bridge, flat-sided stack and new-style transom stern.



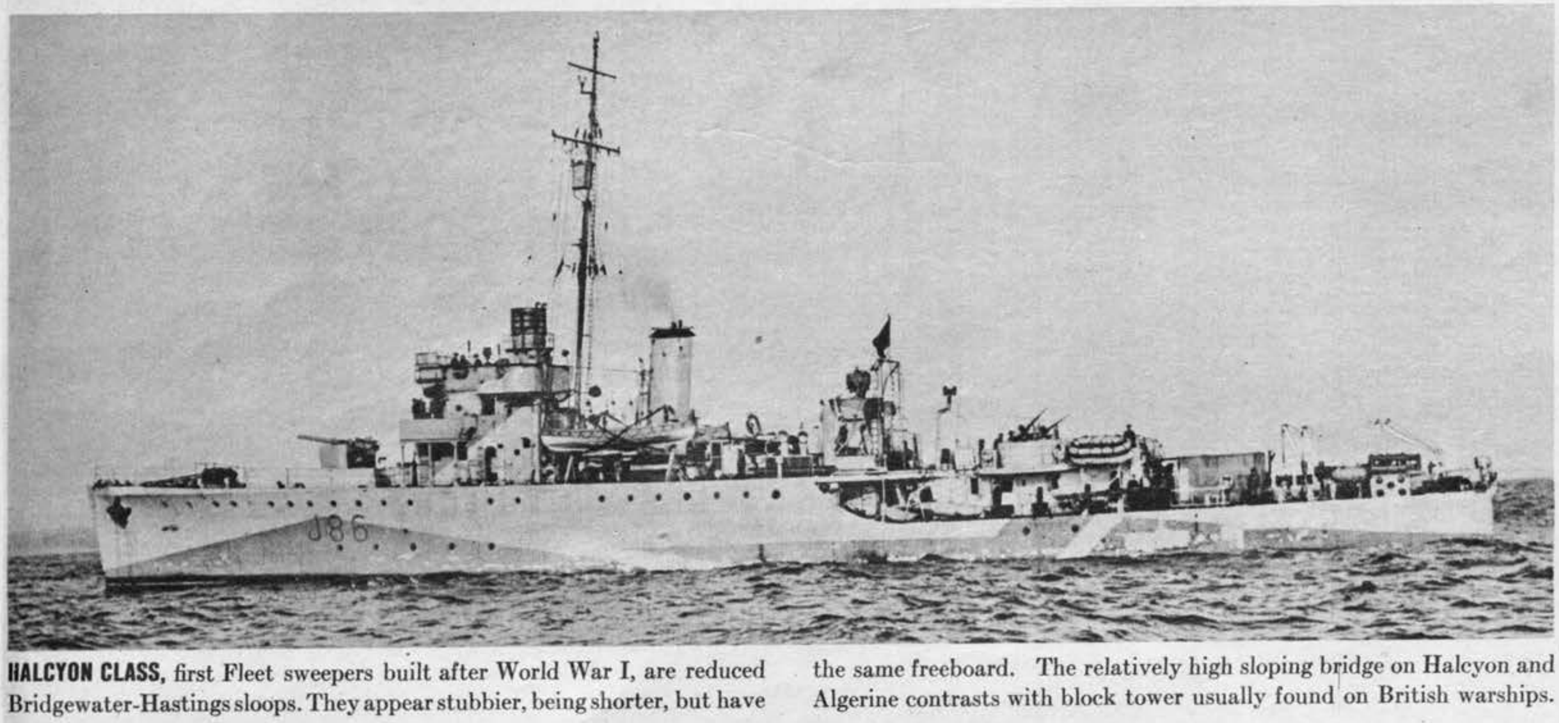
H.M.S. BAYFIELD IS 180-FT. BANGOR CLASS, WHICH ALSO INCLUDES 162- AND 174-FT. VARIANTS. HIGH FORECASTLE GIVES SHORT BANGORS STUBBY APPEARANCE

ly take their places alongside sloops and frigates in anti-submarine patrol.

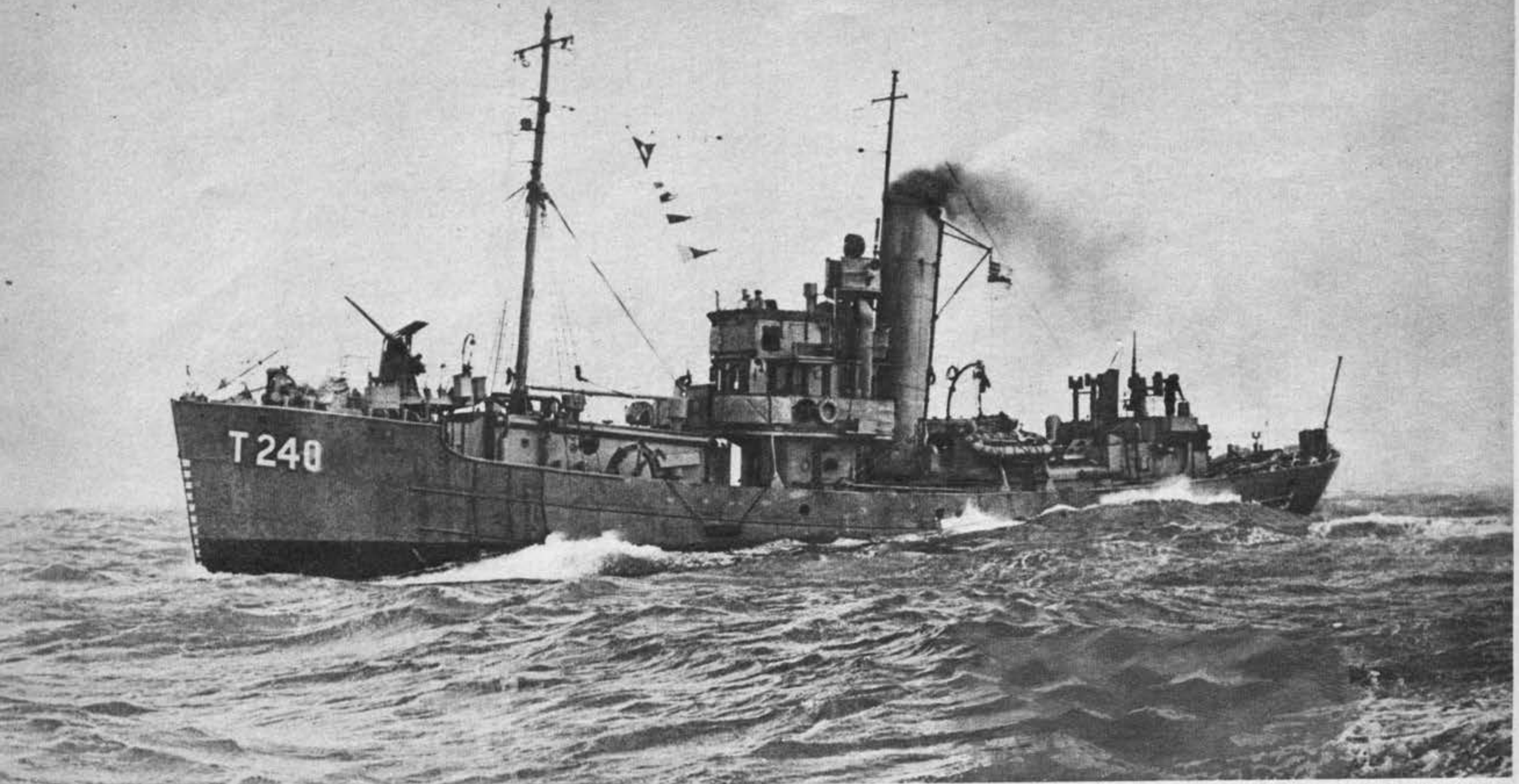
Pictured on these pages are the most important minesweeper classes serving with the Royal Navy. Two of them, the Algerine and Halcyon Classes, have the same general appearance as British sloops and corvettes. H.M.S. Strenuous (*right*) represents a distinctly American design and was lend-leased to the British. The motor minesweeper at lower left is a small coastal type, converted from a commercial design and not representative of any class.



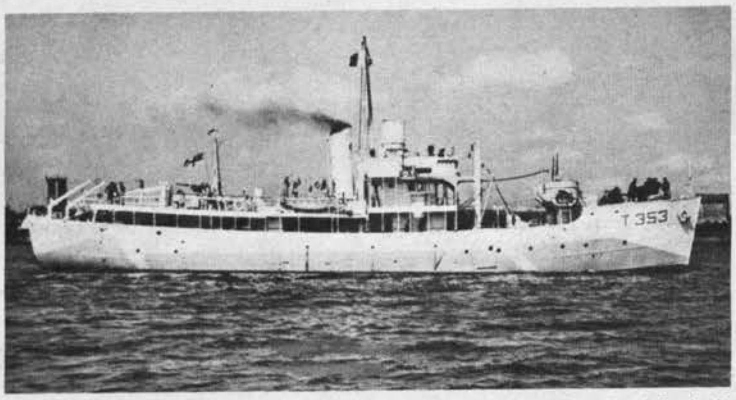
**WIDELY-SPACED BROAD STACKS,** elevated searchlight platform forward of mast identify H. M. S. Strenuous, lend-leased unit of U. S. Weed Class.



**HALCYON CLASS,** first Fleet sweepers built after World War I, are reduced Bridgewater-Hastings sloops. They appear stubbier, being shorter, but have the same freeboard. The relatively high sloping bridge on Halcyon and Algerine contrasts with block tower usually found on British warships.



SIR GERAINT BELONGS TO ROUND TABLE CLASS OF TRAWLERS. DESIGNED BY ADMIRALTY, CLASS RESEMBLES COMMERCIAL TYPES WITH CARGO HOLDS FORWARD



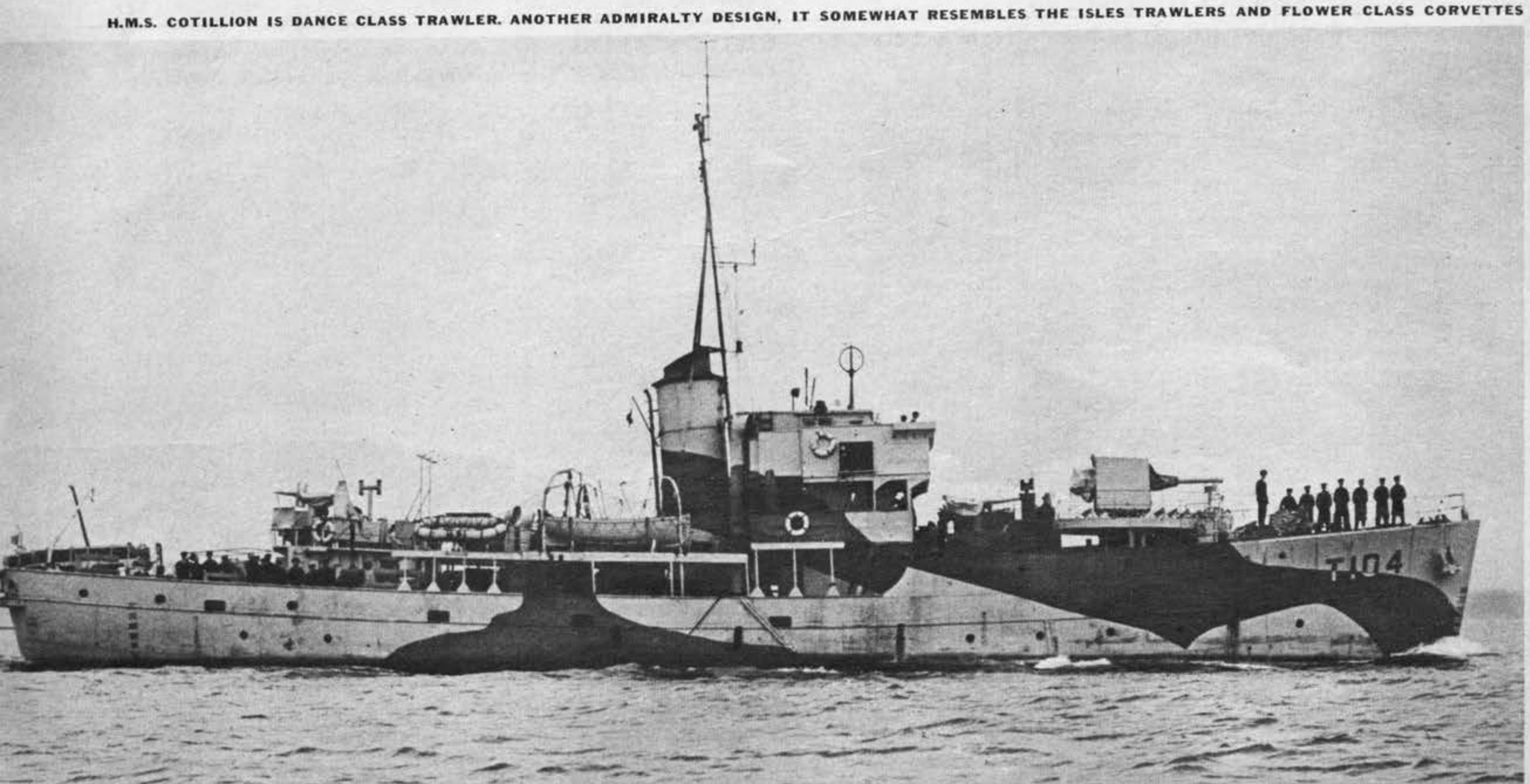
**ISLES CLASS** trawlers are most important ones designed by the Admiralty. Like Farne (*above*) they are named for islands off United Kingdom.

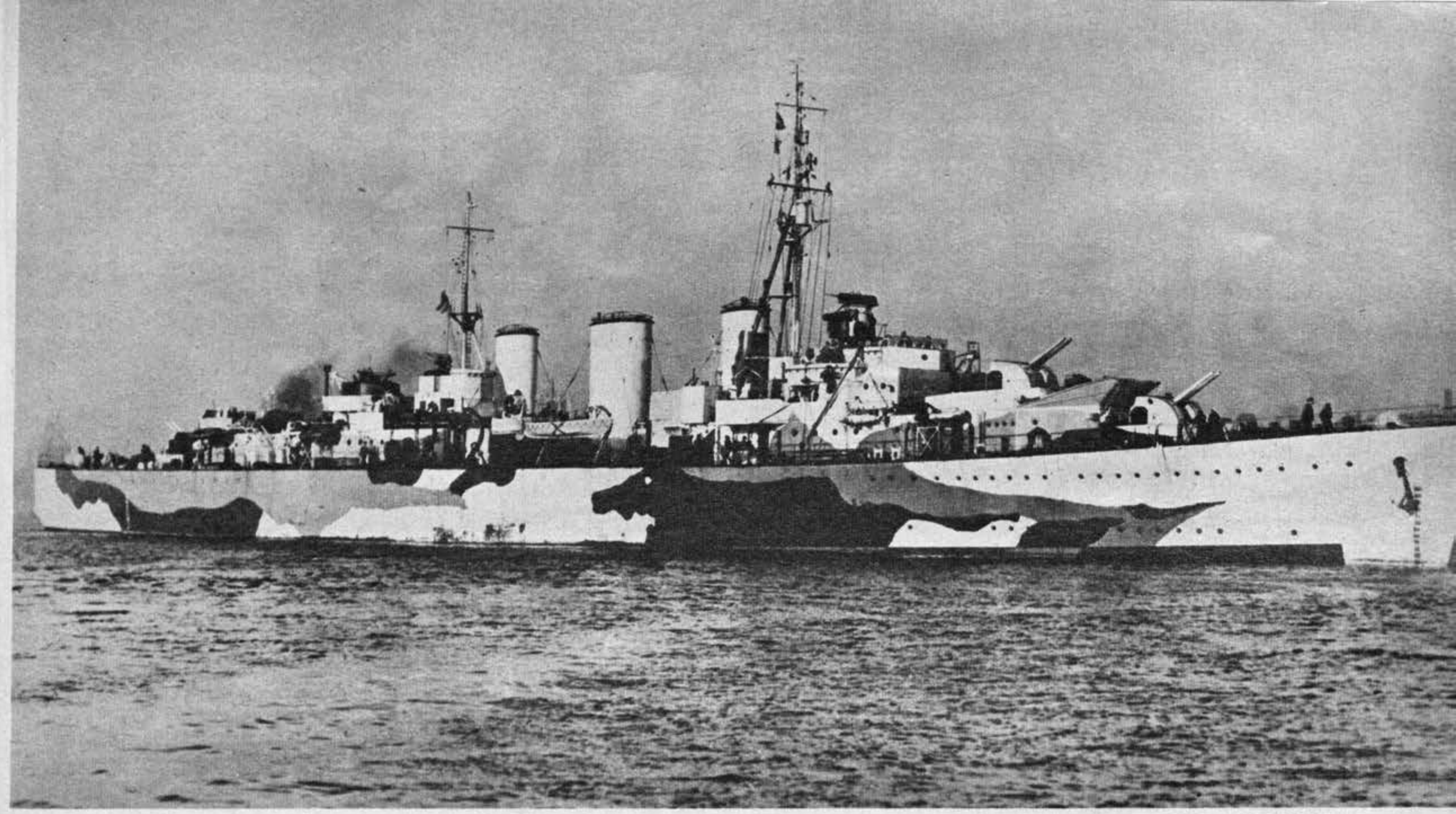
# ODD-JOB CRAFT

There is little in the appearance of a trawler to suggest that it is a fighting ship, one of the most useful in the Royal Navy. A trawler may be a militarized ocean-going fishing vessel, or it may belong to a class built to Navy specifications. Many of the latter resemble corvettes.

Trawlers are a complete patrol and escort fleet in themselves. Guarding the convoys which plod endlessly along the coastline of England, they relieve destroyers, corvettes and frigates for high-

H.M.S. COTILLION IS DANCE CLASS TRAWLER. ANOTHER ADMIRALTY DESIGN, IT SOMEWHAT RESEMBLES THE ISLES TRAWLERS AND FLOWER CLASS CORVETTES



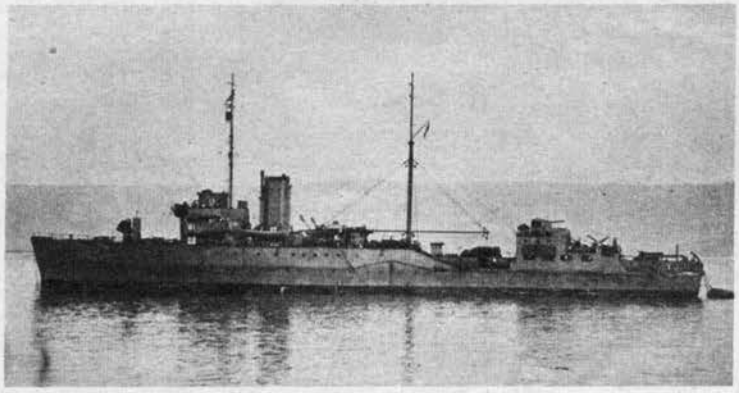


ABDIELS ARE SPEEDY NEW MINELAYERS BUILT FOR TACTICAL FLEET ACTION. DISPLACING 2,650 TONS, ABDIELS CORRESPOND IN SIZE TO LARGE DESTROYERS

# VALUABLE FLEET SUPPORT IS GIVEN BY TRAWLERS, MINE AND NET LAYERS

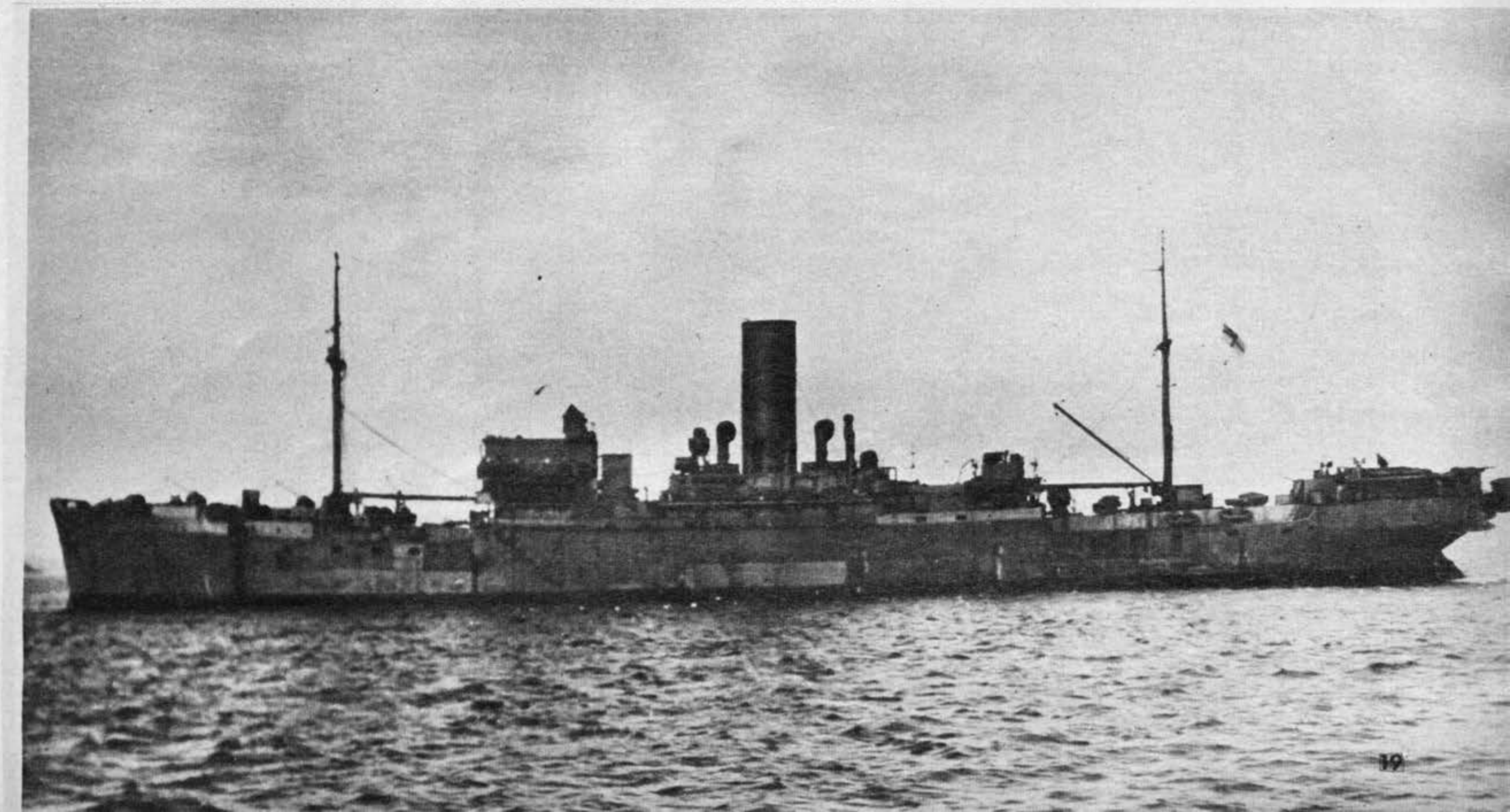
seas action, fight off submarines and planes in waters close to shore.

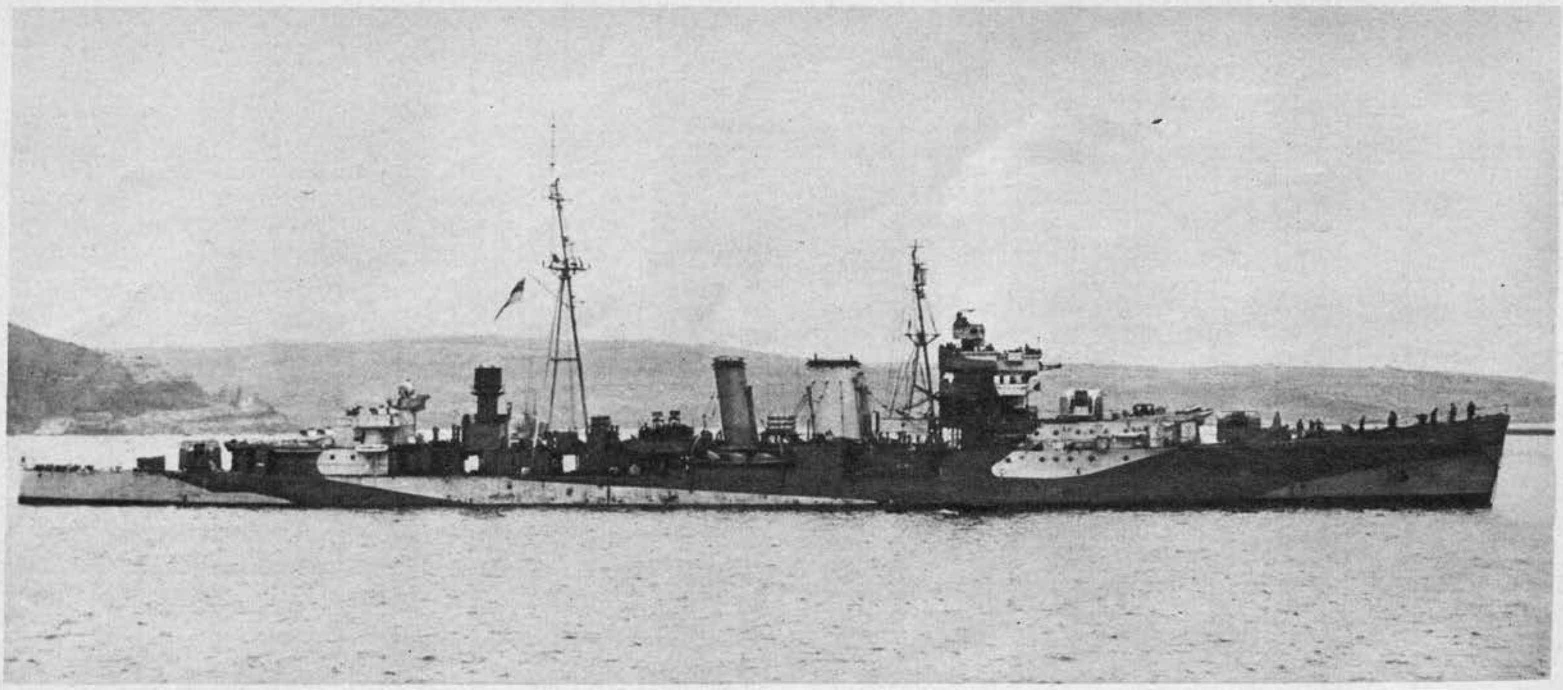
Strategic minelaying in the British Navy is largely done by suitable merchantmen like the Menestheus (*below*), although a specially-built minelaying cruiser, H.M.S. Adventure is in operation with the Fleet. However, fast minelayers, British equivalent of light minelayers in the U. S. Navy, are especially built for their tactical job in contrast to "Old Flushdeckers" used by the U. S. Pictured above is a powerful minelayer of the new Abdiel Class.



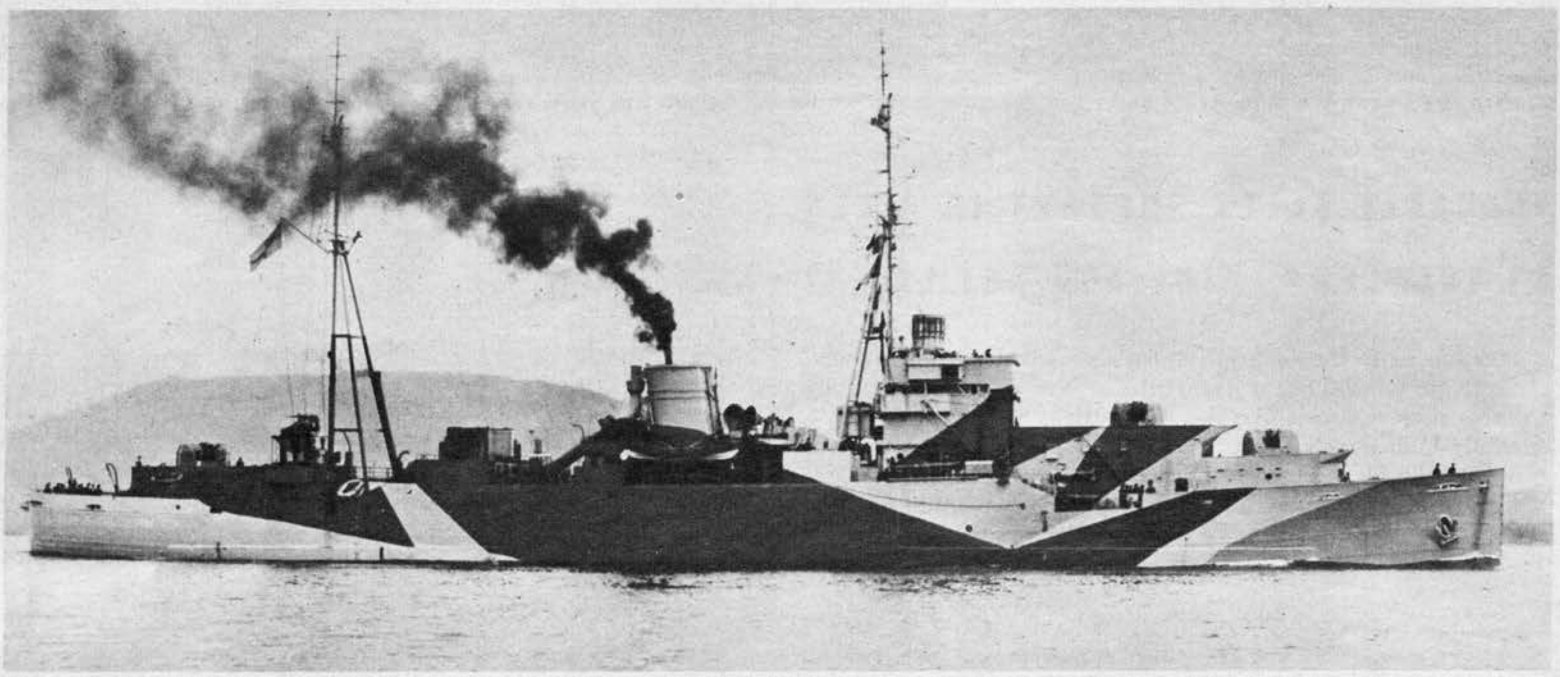
**NETLAYER H.M.S. GUARDIAN** lays, tends anti-submarine nets at advance bases. Single stack well forward, deckhouse aft are important features.

MINELAYER MENESTHEUS WAS CARGO SHIP BEFORE WAR, SHOWS LITTLE OUTWARD CHANGE. SHIP IS USED WHERE RANGE, CAPACITY, NOT SPEED, ARE NEEDED

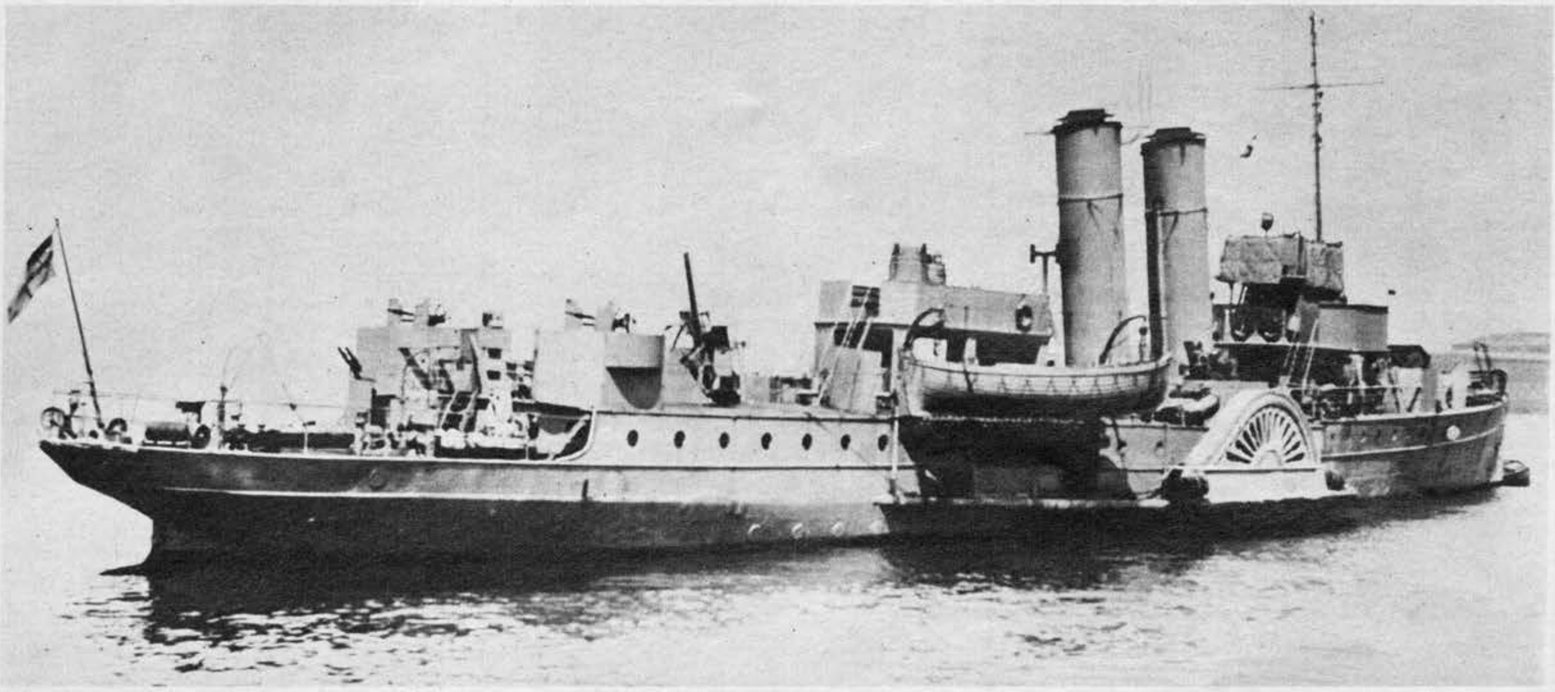




CHANGED ARMAMENT, REBUILT BRIDGE AND MAINMAST, LOWERED FOREMAST FEATURED CONVERSION OF H.M.S. COLOMBO FROM CRUISER TO ANTIAIRCRAFT SHIP



AUXILIARY AA SHIP ULSTER QUEEN IS A FORMER COASTAL STEAMER. ALTERED RADICALLY, SHE NOW HAS WARSHIP'S SUPERSTRUCTURE ON MERCHANTMAN'S HULL



RIVER SIDE-WHEELER GLENMORE WAS CHANGED VERY LITTLE IN HER CONVERSION TO AN AUXILIARY AA SHIP. GLENMORE CAN BE USED ONLY IN COASTAL WATERS

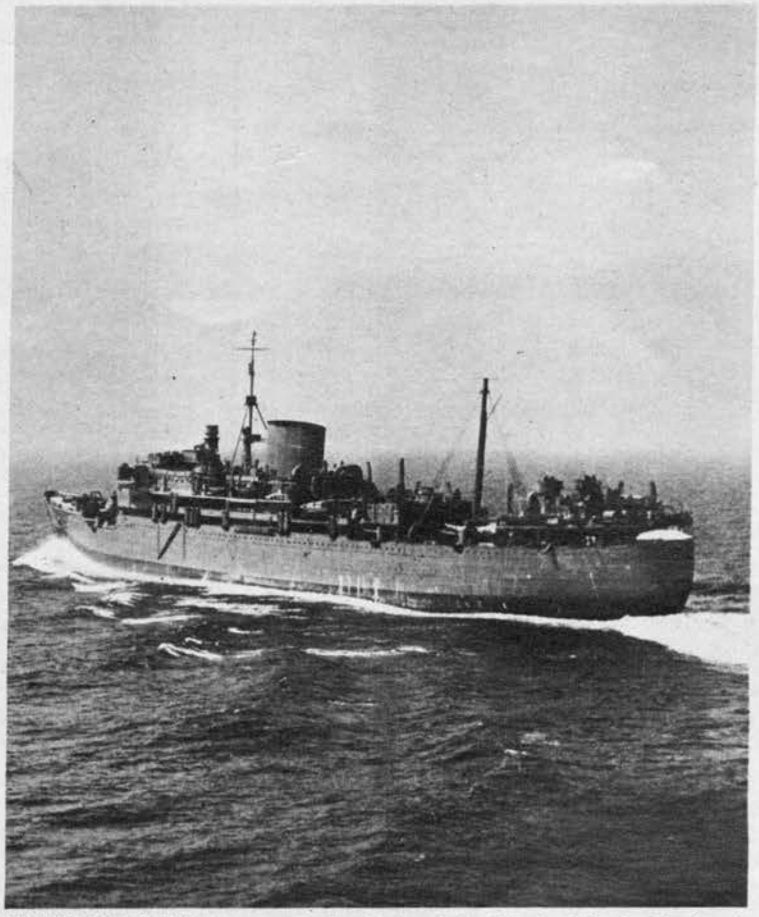
# CONVERSIONS

## OLD LIGHT CRUISERS ARE USED FOR AA DUTY, VARIED MERCHANT TYPES TO CHASE RAIDERS

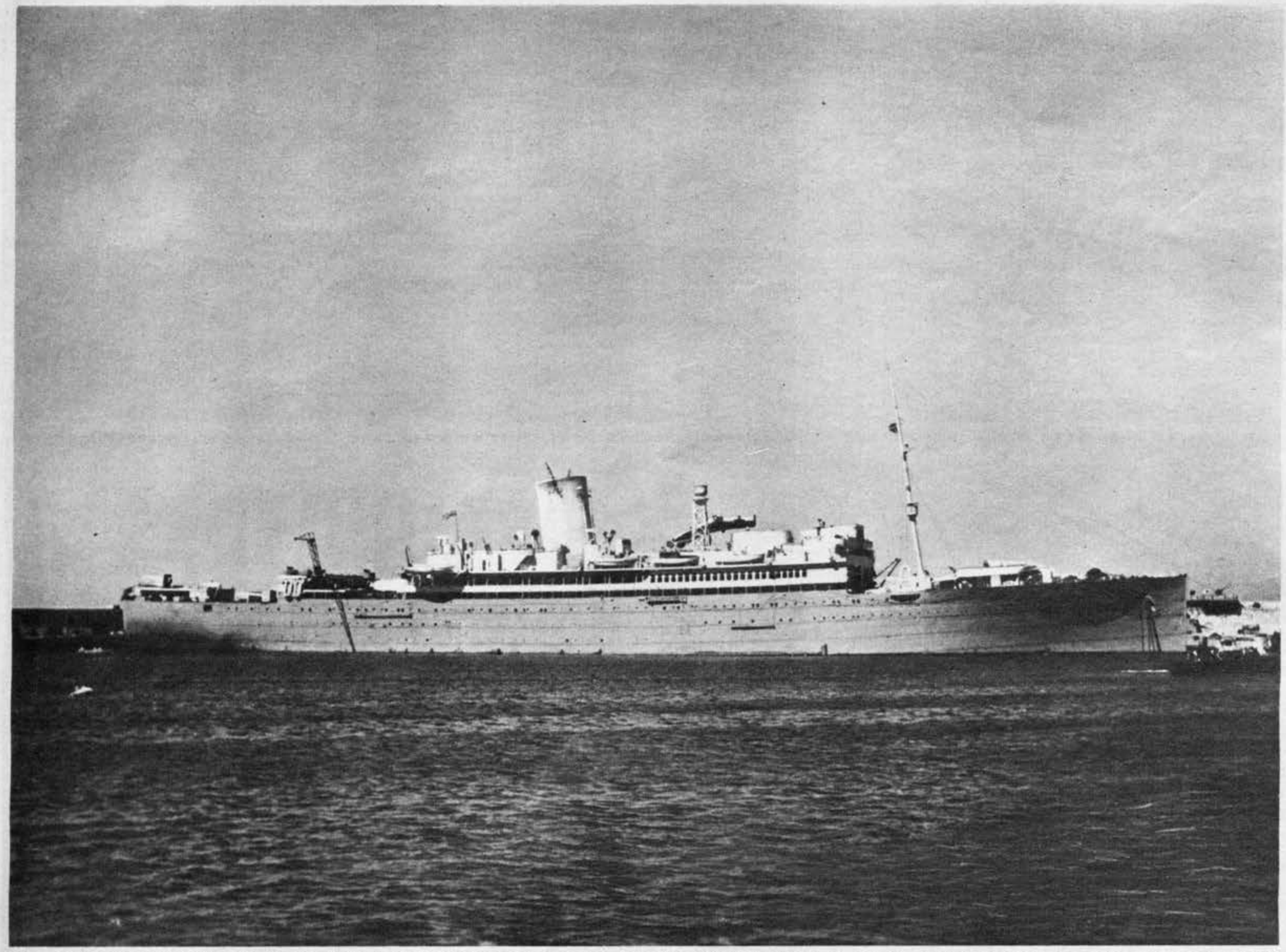
To supplement antiaircraft defense at sea, the Admiralty has put several antiaircraft ships into service. These "antiaircraft ships" are old light cruisers re-armed with dual-purpose batteries.

Typical of these ships is H. M. S. Colombo (*above, left*), a World War I cruiser of the Carlisle Class, now armed with dual-purpose guns in place of the five 6-in. rifles carried before refitting. The appearance of the Colombo and other Ceres-Carlisle ships has been changed very slightly by their conversion. They are long, low vessels with heavy forestacks, thin afterstacks.

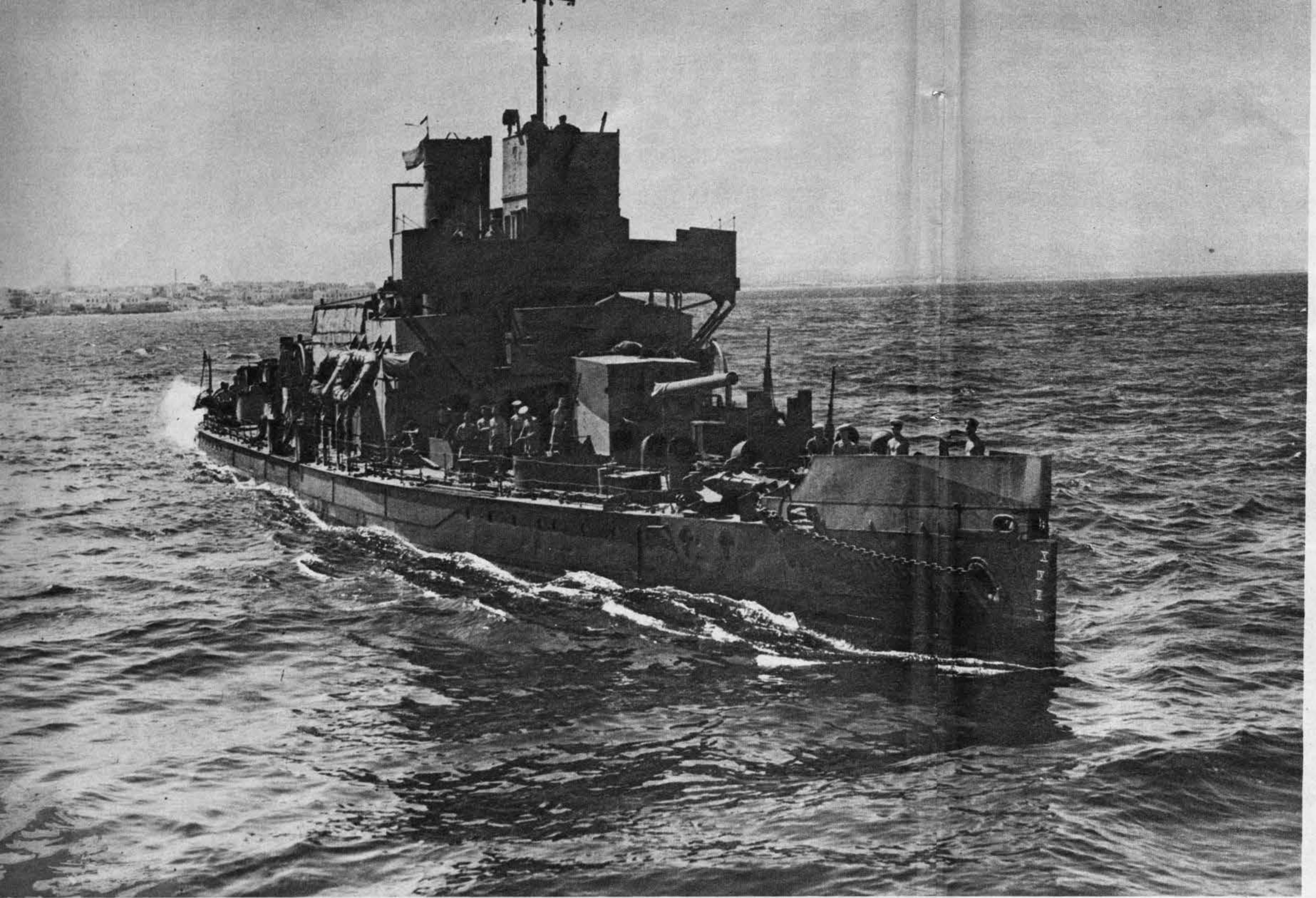
Armed passenger ships constitute a second important group of conversions serving as auxiliaries. At one time a number of these ships were assigned to tracking Nazi surface raiders. Crews of two of these auxiliary cruisers, the Rawalpindi and the Jervis Bay, fought two of the most heroic actions of this war. The Rawalpindi intercepted the heavy cruiser Lützow (then the Deutschland) in the North Atlantic in November 1939 and was pounded to pieces when she chose to fight it out. A year later the Jervis Bay steamed in to act as a buffer when a raider, believed to be the Lützow or her sister ship, the Admiral Scheer, threatened to destroy a convoy of 38 ships. As a result of the Jervis Bay's gallant action, 29 of the merchantmen reached port safely.



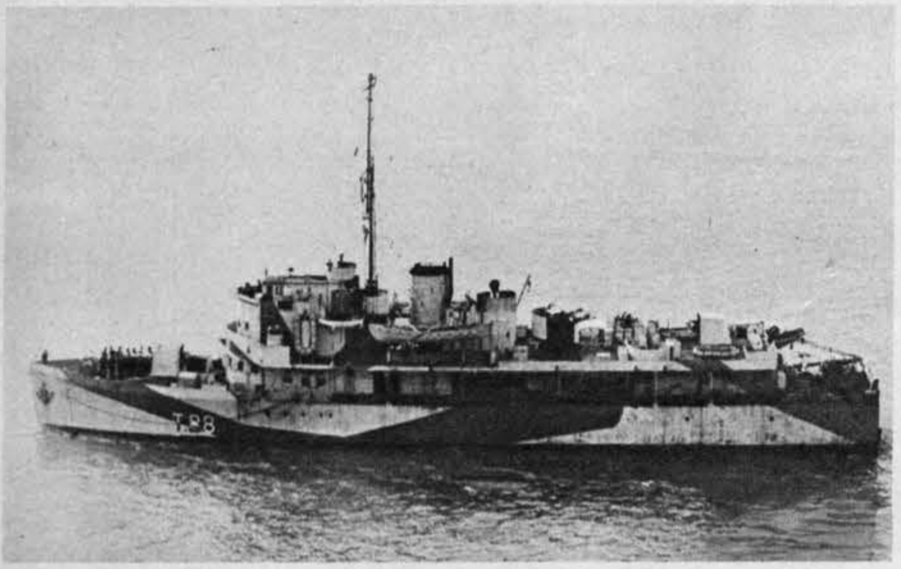
**AUXILIARY CRUISER** Carnarvon Castle battled a Nazi raider in the South Atlantic and put the foe to flight despite suffering damage and casualties.



THE ALCANTARA LOST FORESTACK IN CONVERSION TO AUXILIARY CRUISER. SHIP IS PASSENGER TYPE, IS CALLED ARMED MERCHANT CRUISER IN ROYAL NAVY



H.M.S. APHIS, RIVER GUNBOAT OF THE "INSECT" CLASS, HELPED REDUCE PANTELLERIA'S DEFENSES WITH 6-IN. GUNS. TWIN STACKS OF "INSECT" CLASS SHIPS ARE PLACED ATHWARTSHIPS; FROM SOME BOW ANGLES ONE IS INVISIBLE



**H.M.S. LOCUST** looks more like a houseboat than a gunboat. It can be recognized by upper deck which extends far aft from the bridge. Single guns are mounted fore and aft.

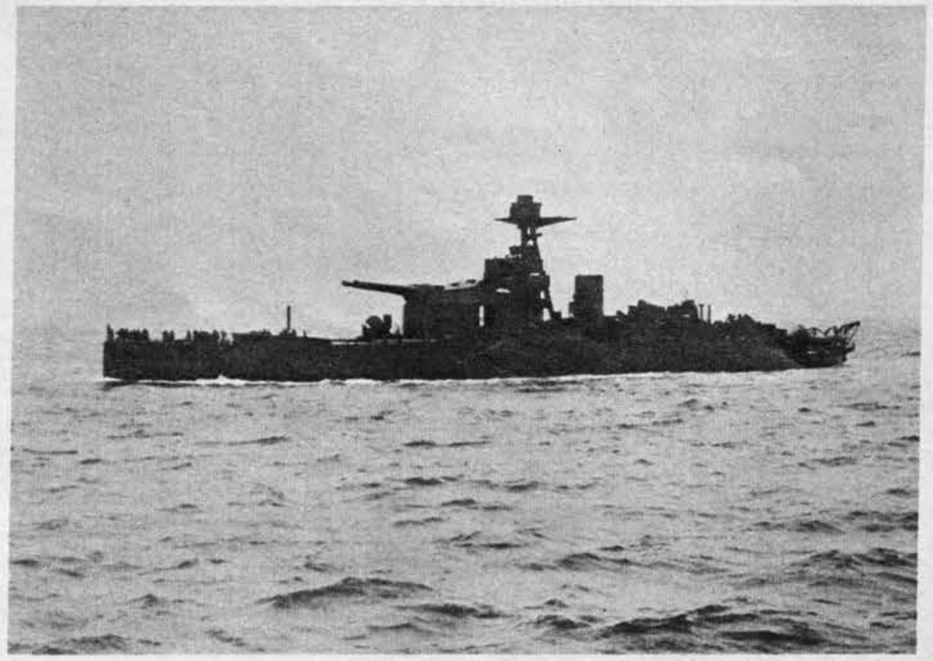
# MONITORS & GUNBOATS

## THEY SHELL ENEMY'S COAST, SUPPORT LANDING OPERATIONS

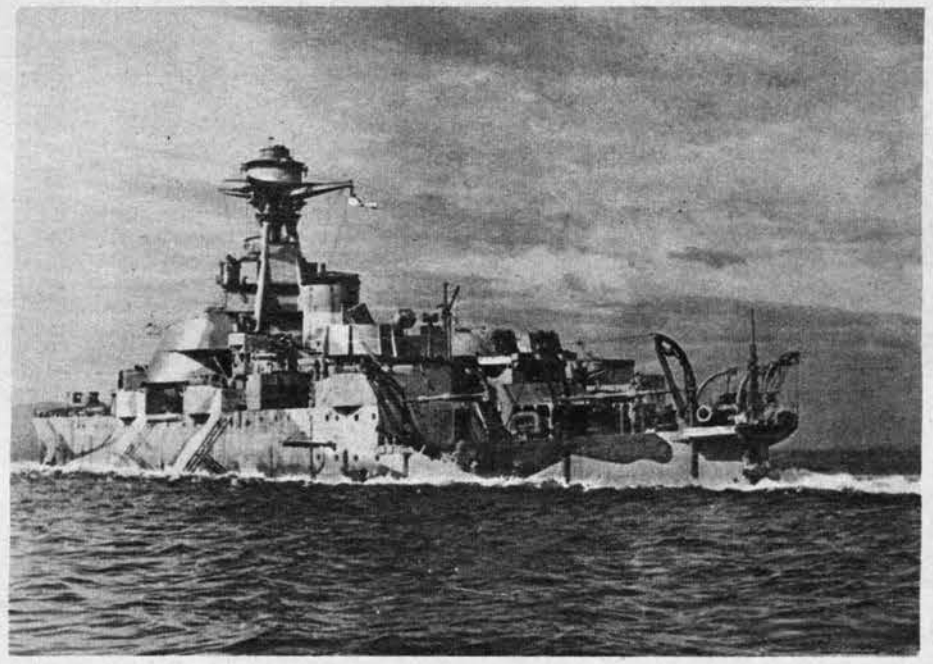
At a time when it was considered unwise for ships to come within range of shore batteries, H.M.S. Aphis (*above*) and the monitor, H.M.S. Terror carried out a daring bombardment of Bardia. The raid paved the way for the port's capture by General Wavell's Army of the Nile. This was just a beginning, as the monitors and gunboats time and again pummeled Axis troops along North African shores.

The powerful monitors of the Royal Navy have been engaged in many offshore bombardments. With an offensive armament of two heavy guns their job is to stand offshore and slug, relieving valuable cruisers and battleships from a dangerous job. Hence the emphasis is on cheap and rapid construction. The ships are slow; their armor is light; their guns come from surplus stocks. Underwater protection, however, is very complete. Their shallow draft enables them to navigate shoal waters.

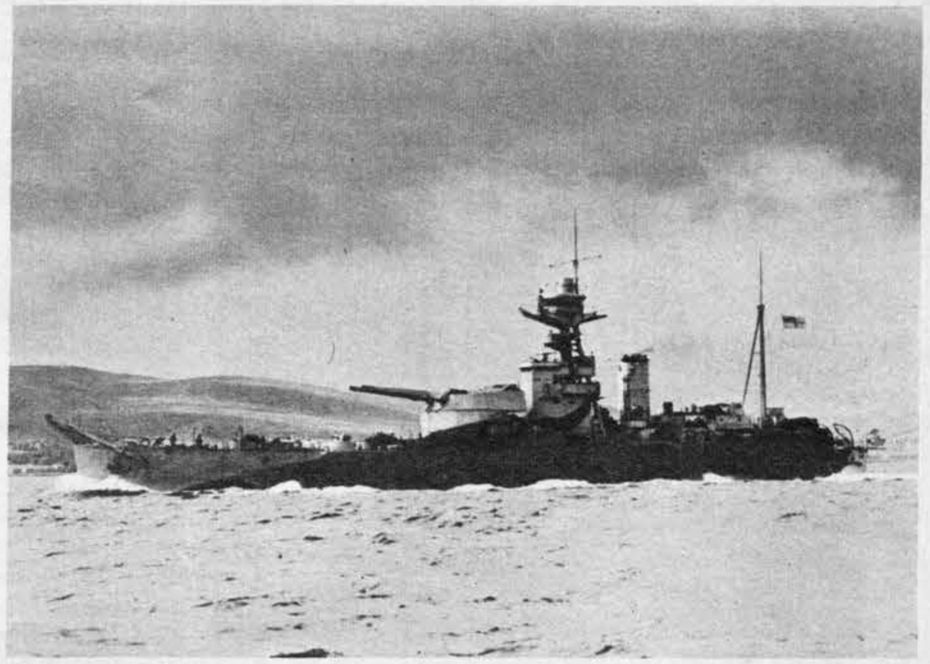
River gunboats are light, shallow-draft patrol vessels built for policing inland waters. Several British ships of this type escaped from the Far East before the Japs could sink or seize them. Assigned to the Mediterranean, they proved helpful in supporting the Eighth Army's advance across Africa.



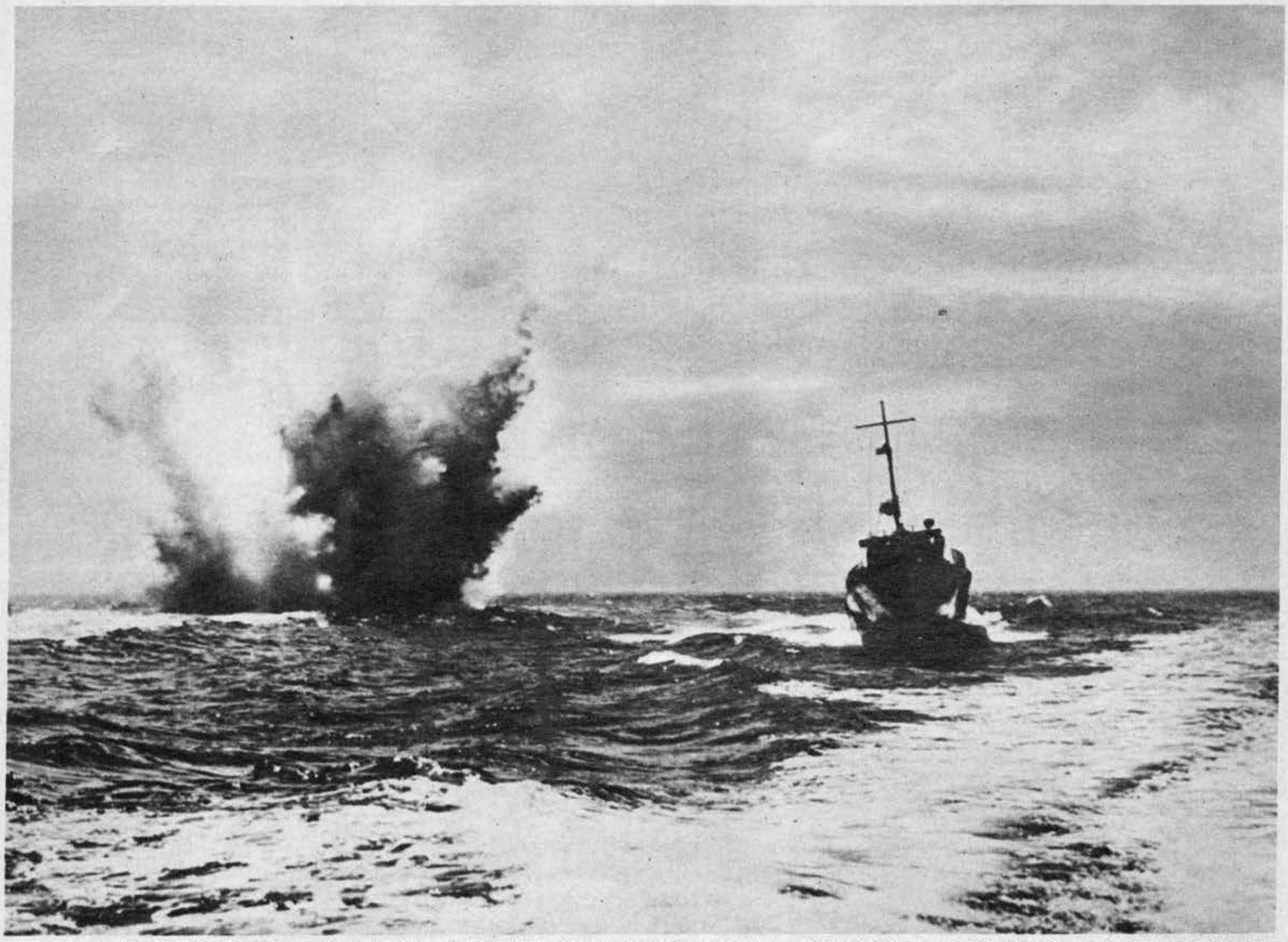
**BIG GUNS** seem out of proportion on 7,200-ton monitor Erebus. Squat stack, heavy tripod mast are important features. Sister ship H.M.S. Terror was sunk off Libya in 1941.



**STERN VIEW** of Erebus shows break in deck at quarterdeck. Pronounced anti-torpedo blisters can be seen as bulges from the air. Ship carries two 3-in. AA guns, 12 smaller ones.

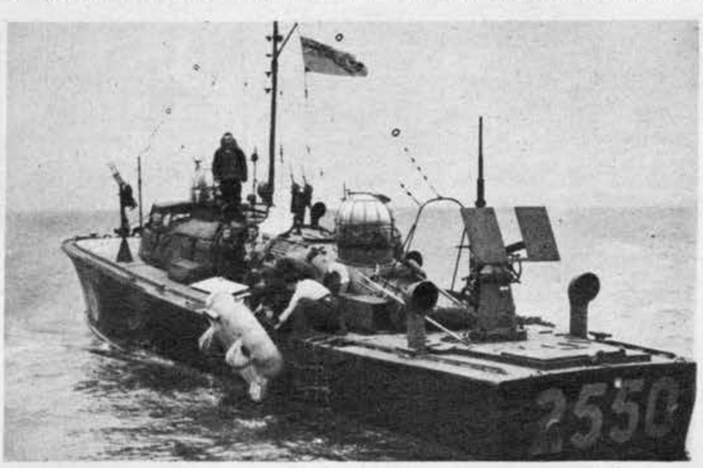


**ROBERTS CLASS** monitors show strong resemblance to Erebus, added mainmast, thinner stack being differences. Monitors have heavy tower bridges typical of British warships.



FAIRMILE MOTOR LAUNCH DROPS DEPTH CHARGES OVER U-BOAT IN GULF OF ST. LAWRENCE. DETAILED VIEW OF FAIRMILE IS SHOWN ON FACING PAGE

**VOSPER TYPE MTB** races through Chesapeake Bay on trial run. These fast torpedo boats are being built for the British in U.S. shipyards.



**RAF'S ROUNDELS** mark rescue launch shown rescuing Allied pilot from North Sea. Launch is armed with Oerlikon cannon, six machine guns.

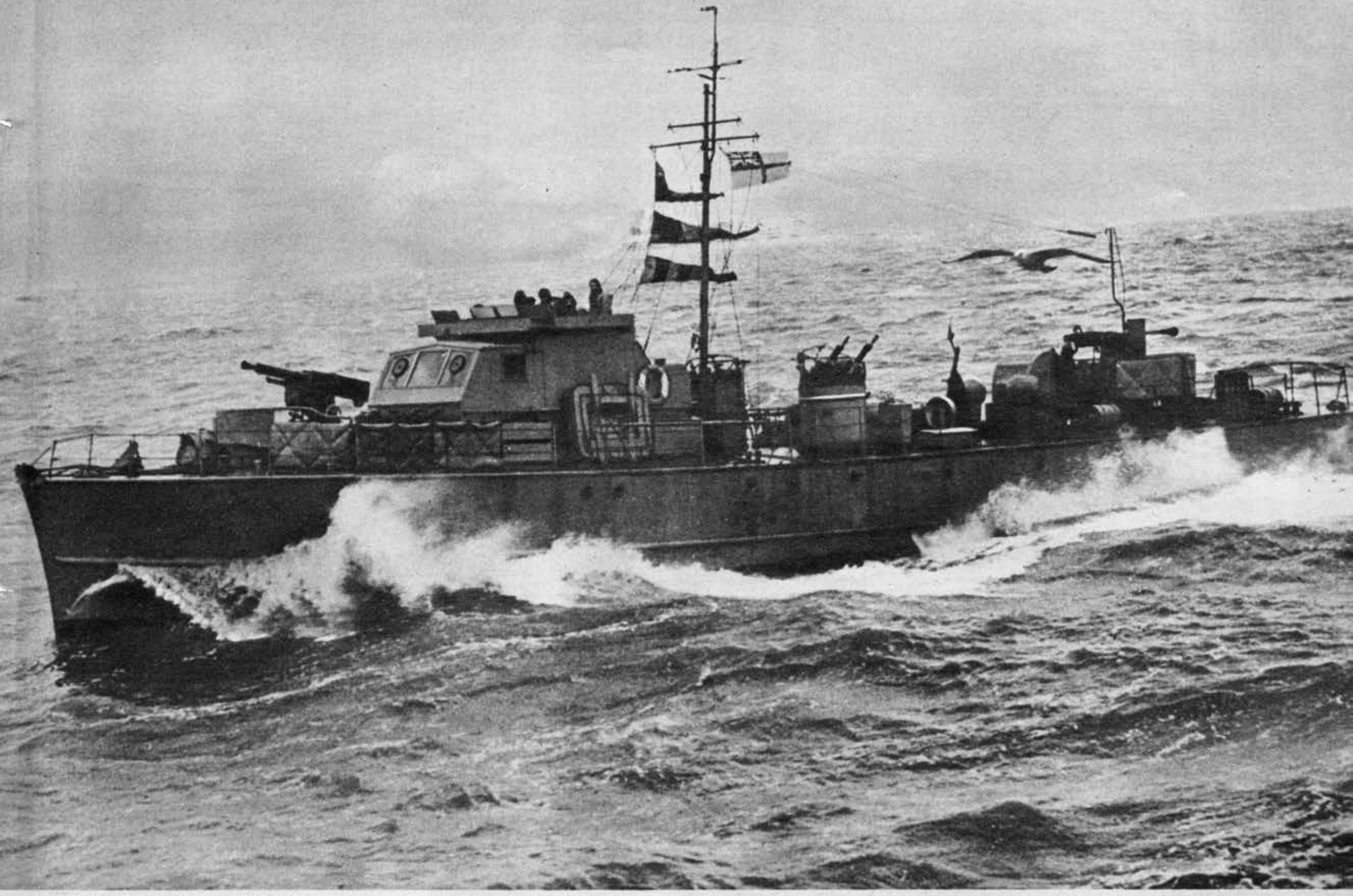
# COASTAL CRAFT

## FAST NEW FLEET OF MOTORBOATS FIGHTS GUERILLA WAR IN NORTH SEA, CHANNEL

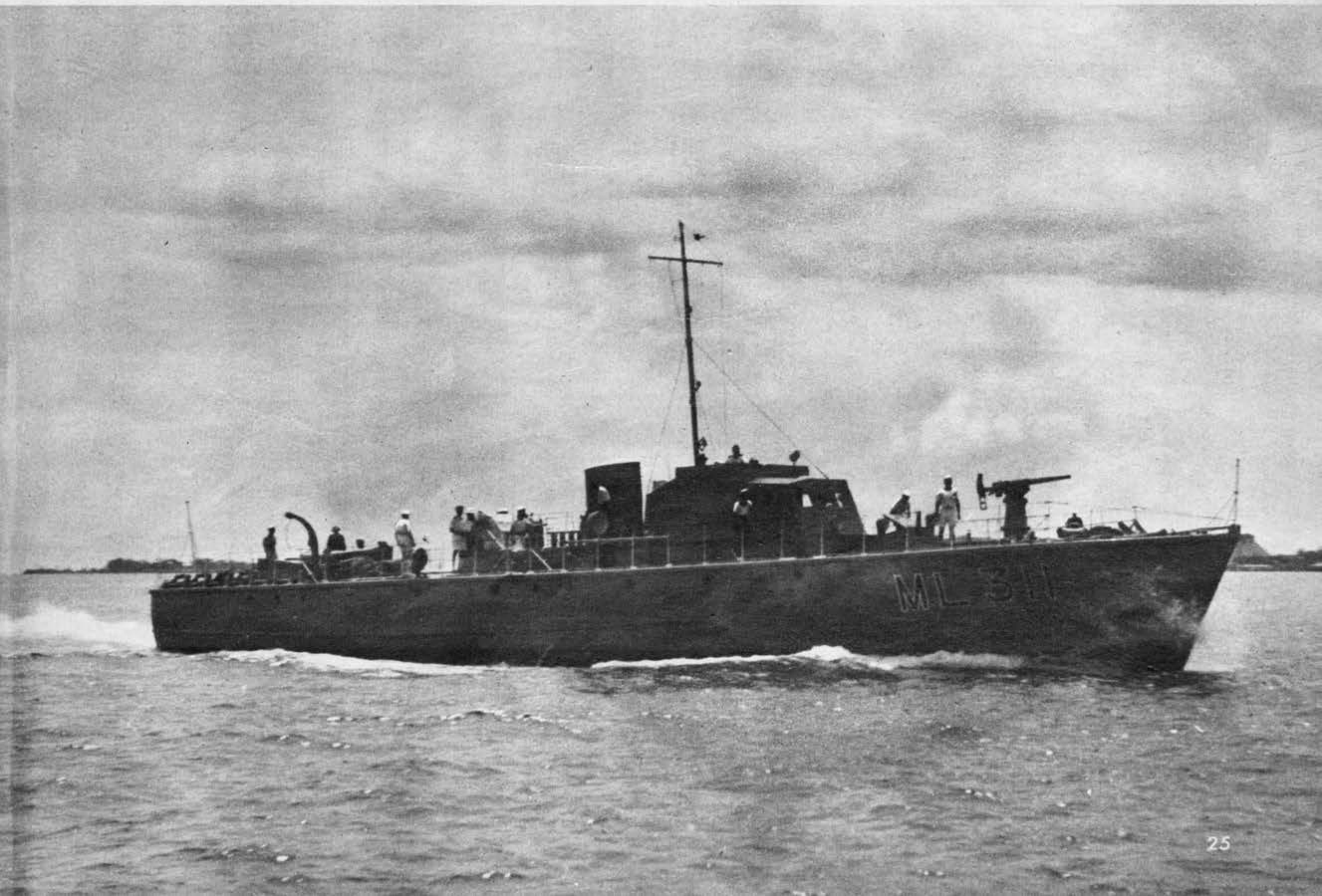
In the Channel and the North Sea, British small boats are fighting an important battle of defense, attack, and even sea rescue. They defend their own convoys from the sniping of Nazi E-boats and submarines; they scour the sea for British and American airmen in distress; they slash at German seaborne commerce all along Europe's northwest coast, reversing the situation prevailing in the North Atlantic.

German shipping off Norway expanded tremendously late last summer following Sweden's decision to curb the transit of German troops and goods over her railways. The result of this expansion was to spur the Royal Navy's Coastal Patrol to increase its already growing activities. The Coastal Patrol's personnel made up mostly of swashbuckling reservists has mushroomed from 40 officers and 200 ratings in 1939 to 2,000 officers, 15,000 ratings toward the end of 1943. In the period from January 1941 to March 1943, the Coastal Patrol averaged one action per week. Between March and the following May the figure jumped to one a night.

Most important types in the Coastal Patrol are motor gunboats (MGB), motor torpedo boats, (MTB) and motor launches (ML). In addition there are the air-sea rescue launches (*left, below*) of the RAF. Size and armament of the coastal craft vary considerably; representative units are shown on these two pages.



**"C" CLASS MGB** *(above)* is a heavily-armed vessel, too big to ride with bow high like MTB's. Craft of this type were introduced as an answer to German E-boats which raided Channel convoys. Fairmile type subchaser *(below)* is typical motor launch. ML's can be recognized by small stack just abaft low bridge. These launches have joined river gunboats in shore bombardments, perform a variety of patrol and escort duties.



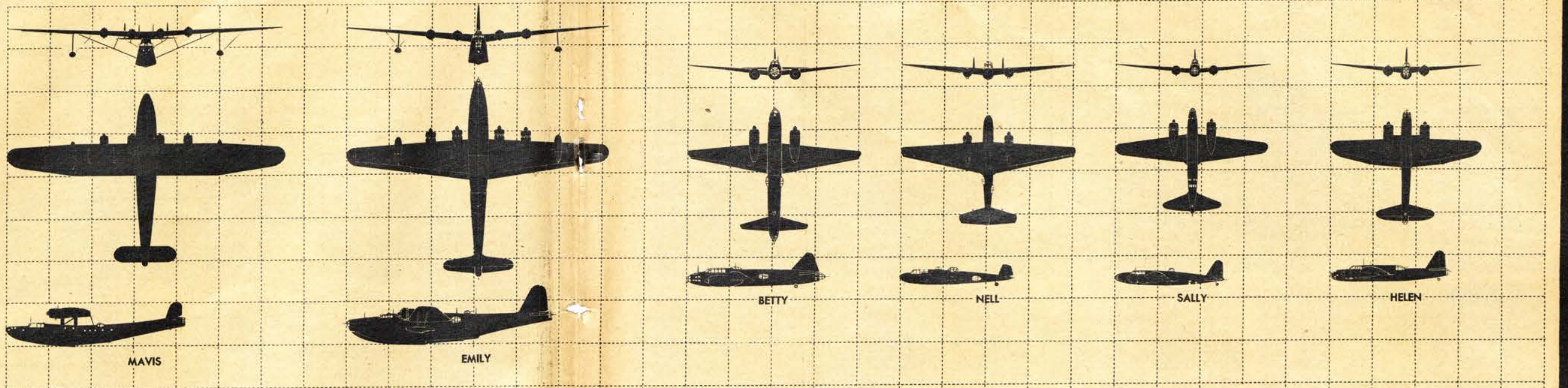
# ENEMY AIRCRAFT

## PRINCIPAL JAPANESE & GERMAN TYPES

~~RESTRICTED~~

On these pages is a survey in silhouettes of the most important types of enemy aircraft in operational use. The 37 planes are selected only on the basis of their prominence in the Pacific and European theaters. Thus the first group of 19 Japanese aircraft ranges from the familiar Mavis, giant seaplane, to Tojo, the smallest and latest Jap fighter. Below, the German airplanes include such contrasting types as the Me-323 powered glider, and the veteran, Me-109 (G & F). A future issue of the *Journal* will present a similar spread of Allied airplanes. Together, they will be a concise summary of top-flight planes in action on all fronts.

**SCALE: EACH SQUARE EQUALS 20 FT.**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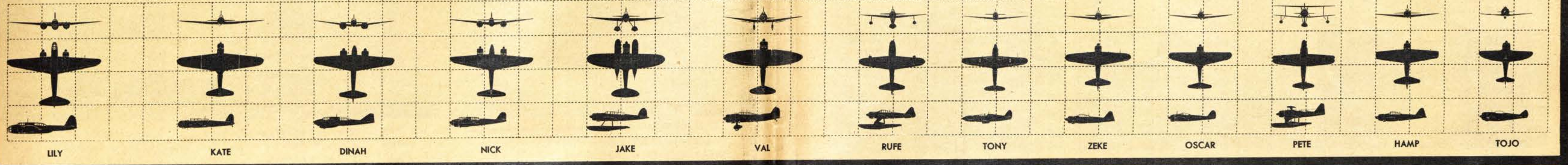
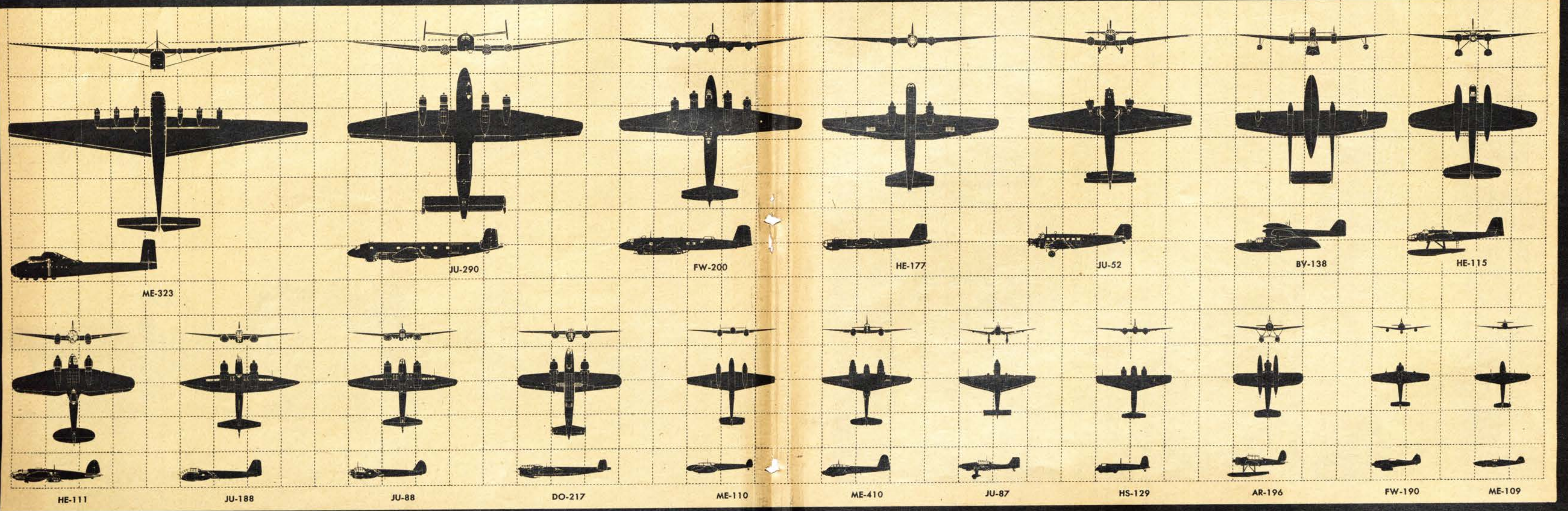
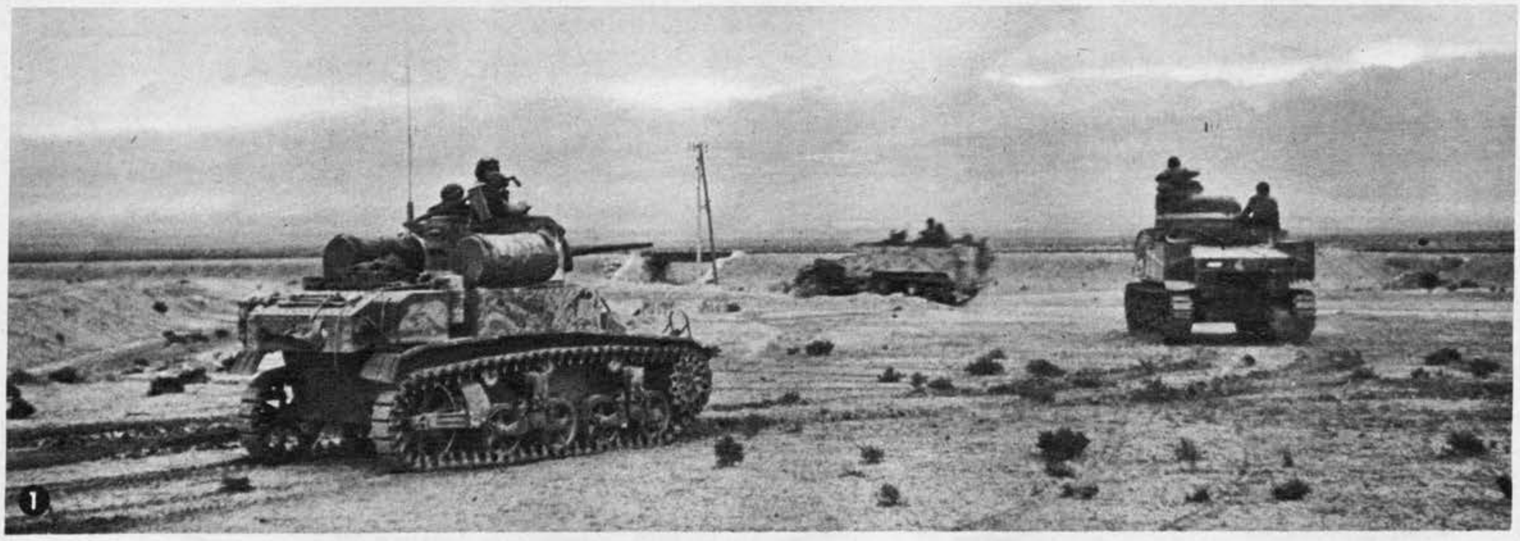
EMILY
BETTY
NELL
SALLY
HELEN


LILY
KATE
DINAH
NICK
JAKE
VAL
RUFE
TONY
ZEKE
OSCAR
PETE
HAMP
TOJO


ME-323
JU-290
FW-200
HE-177
JU-52
BV-138
HE-115
HE-111
JU-188
JU-88
DO-217
ME-110
ME-410
JU-87
HS-129
AR-196
FW-190
ME-109

# QUIZ NO. 2: A DOZEN ARTILLERY WEAPONS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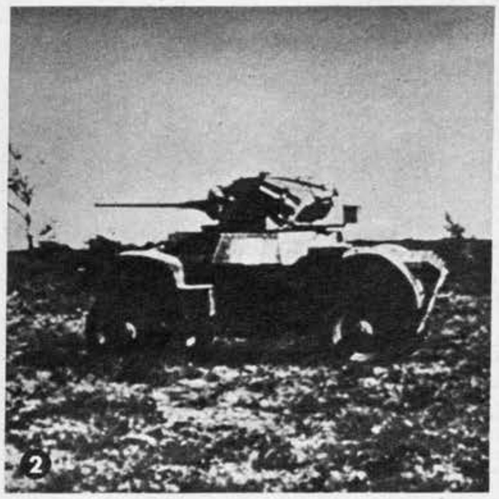
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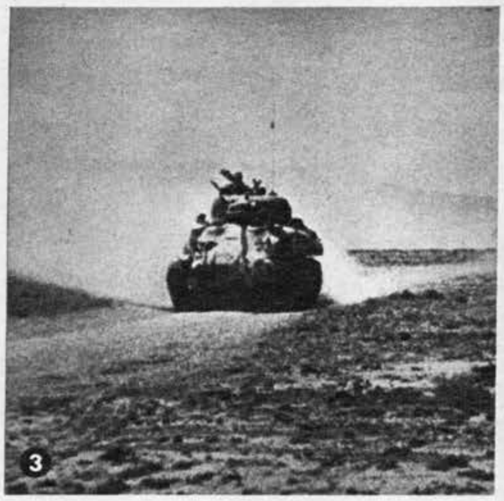
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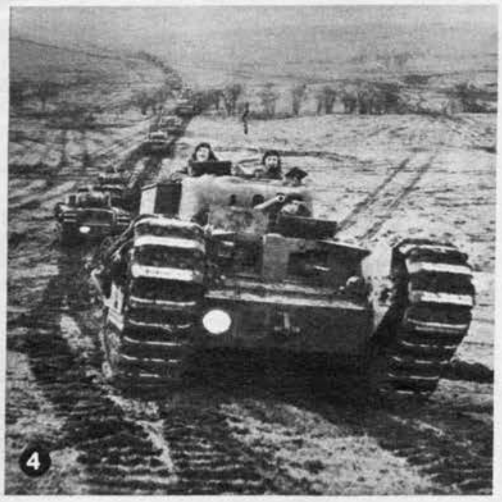
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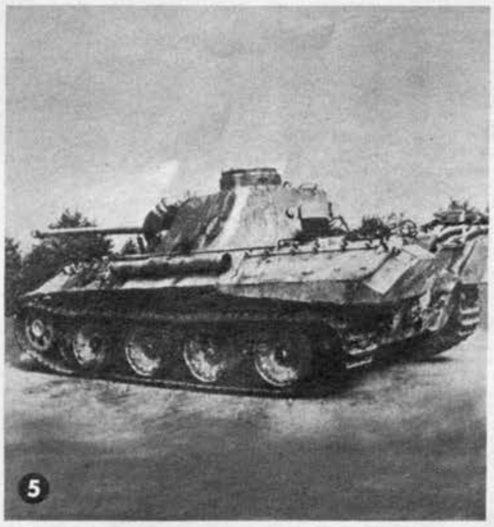
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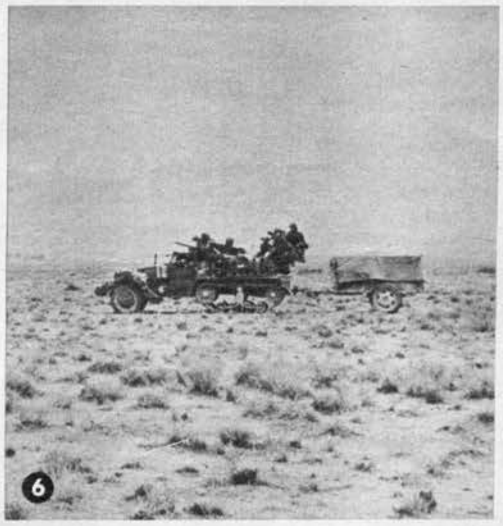
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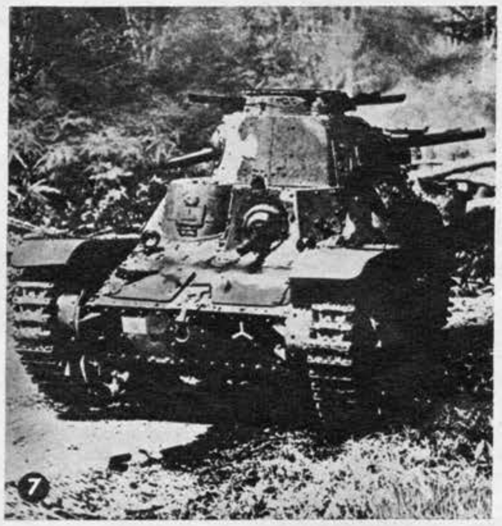
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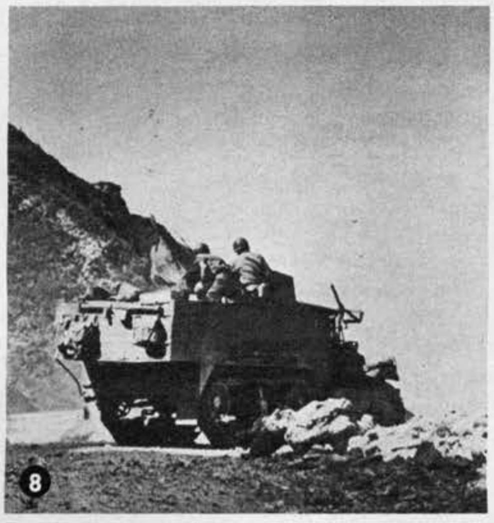
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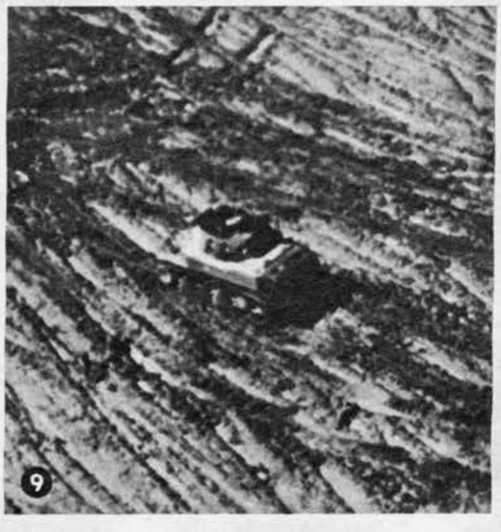
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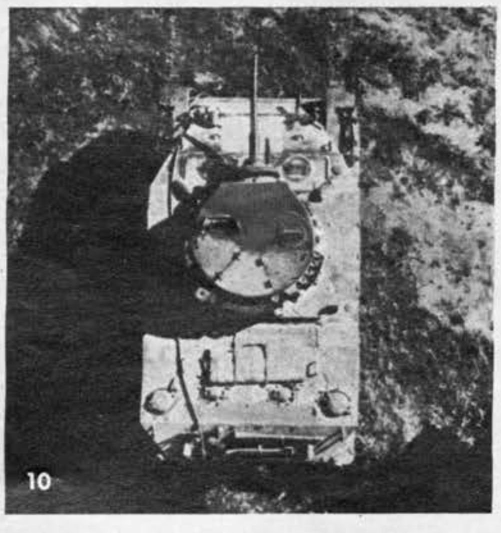
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For answers, see p. 50

TOWED BY C-60 CARGO PLANES, CG-4A'S SAIL OVER COUNTRYSIDE. ONLY OPERATIONAL U.S. GLIDER TO DATE, CG-4A TOOK PART IN THE SICILIAN INVASION

# WAR GLIDERS

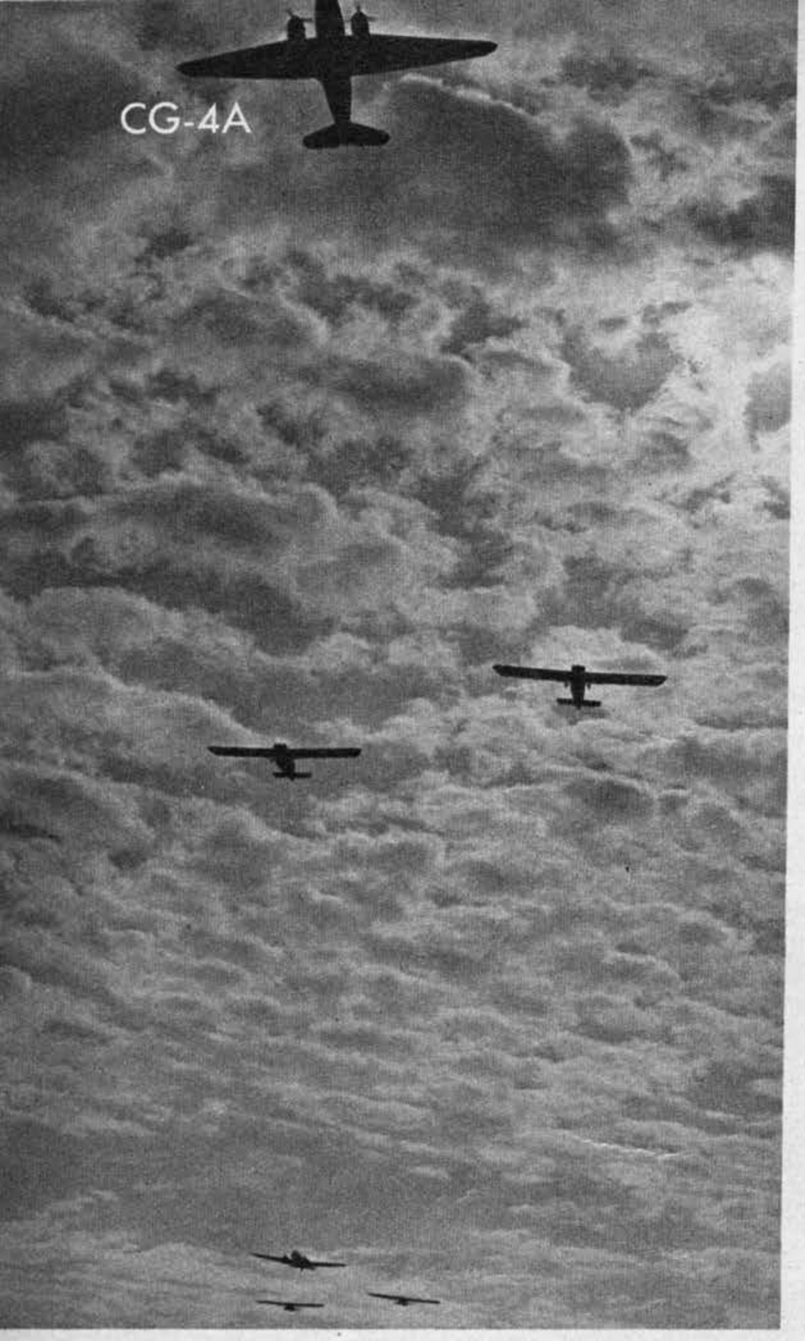
## NEW DESIGNS SHOW GREAT PROMISE FOR AIRBORNE ATTACK AND SUPPLY

Big, rugged and ugly, military gliders are designed to be stuffed with all the weight they can carry and are capable of setting down rapidly once tow lines are released. Unlike graceful civilian sailplanes, which have low wing-loading and are built to take advantage of every bit of wind which may keep them aloft, these landing barges of the air are not designed to soar and do not have the aerodynamic beauty of sport gliders.

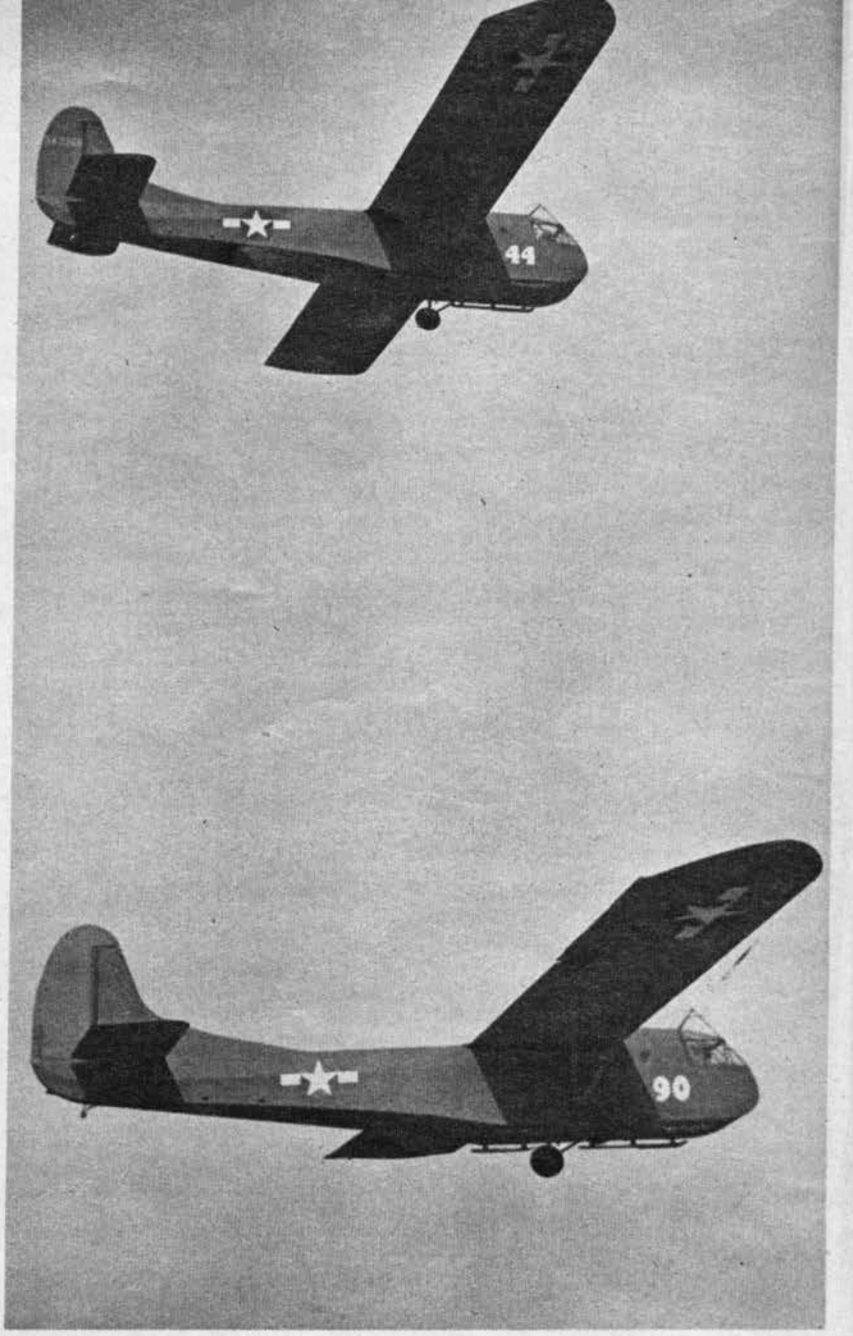
In airborne operations gliders are likely to dive in after paratroopers have gone in to mark drop zones. The glider borne troops and paratroops are likely to be the initial assault wave back of enemy lines, their mission being to seal off enemy reserves, destroy communications, and perhaps seize an aerial beachhead. During this stage of the assault gliders are important since they carry heavy weapons which cannot be dropped by parachute and can deliver a formidable and concentrated load of men at a predetermined spot.

In addition to its use as an assault weapon, the glider has many applications in the field of supply. Able to slide in on terrain which would wreck a cargo plane, gliders can deliver all sorts of equipment including aircraft repair shops, field kitchens, complete radio, weather and radar stations, jeeps and trucks. Aircraft equipped with pickup gear can recover a glider from a field 1,200 ft. long with obstacles 50 ft. high at both ends (*see cover*). Even more important—a glider being retrieved can bring out wounded or equipment that needs salvage or repair. Moreover, a tow plane which drops a glider does not have to land.

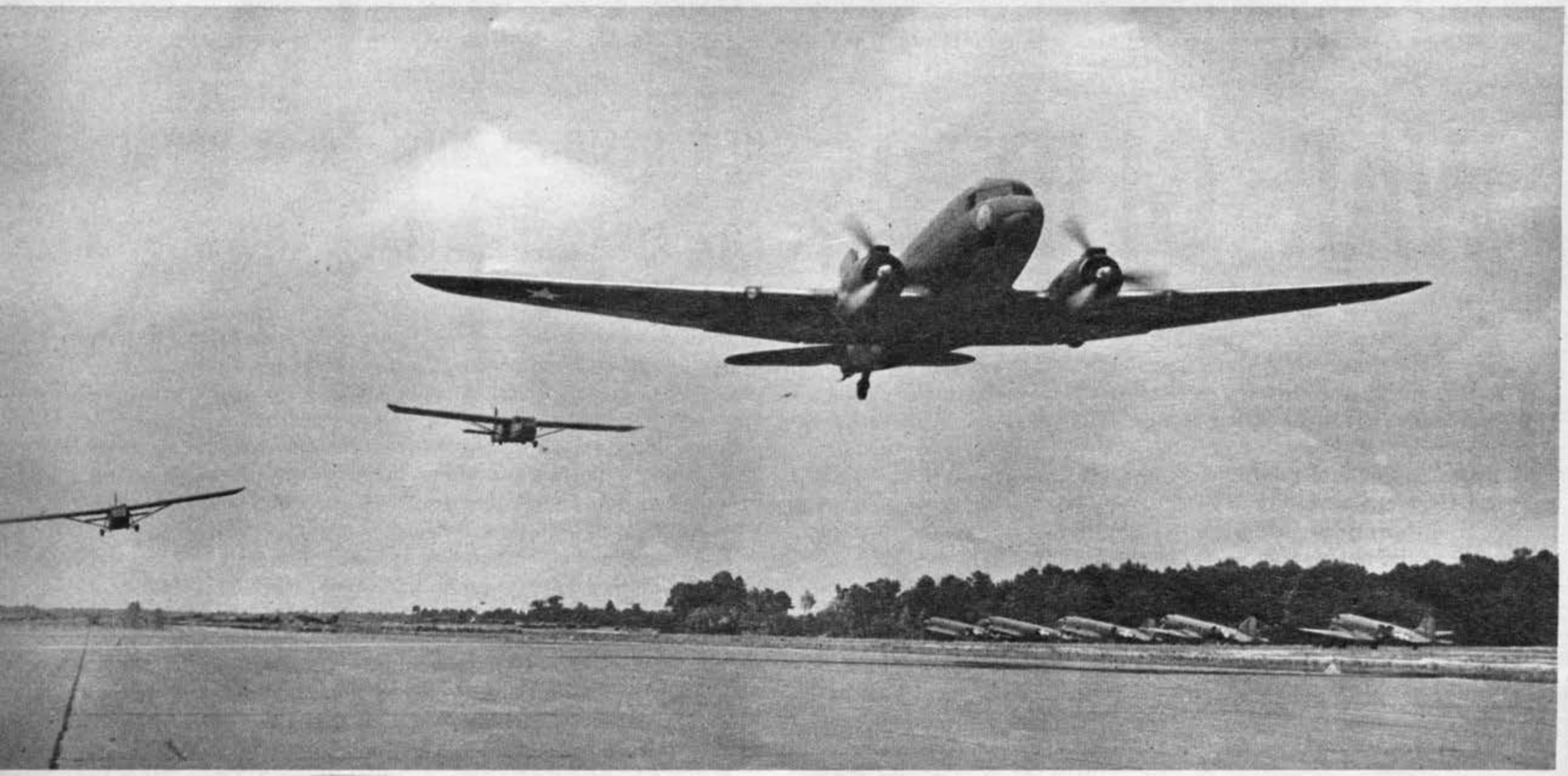
The delivery of CG-4A gliders to operational units of the Troop Carrier Command began in January 1943, while first large-scale maneuvers with the CG-4A's were held the following May. The first and so far only combat use of gliders by the Allies was in the 8th Army sector of the Sicilian invasion with U.S. CG-4A's and British Horsas taking part. They contributed heavily to Gen. Montgomery's swift success in the early phases. With gliders already standard in German tactics and likely to be used on a larger scale in future Allied operations, the *Journal* is presenting the principal U.S., British and German types on the following pages.



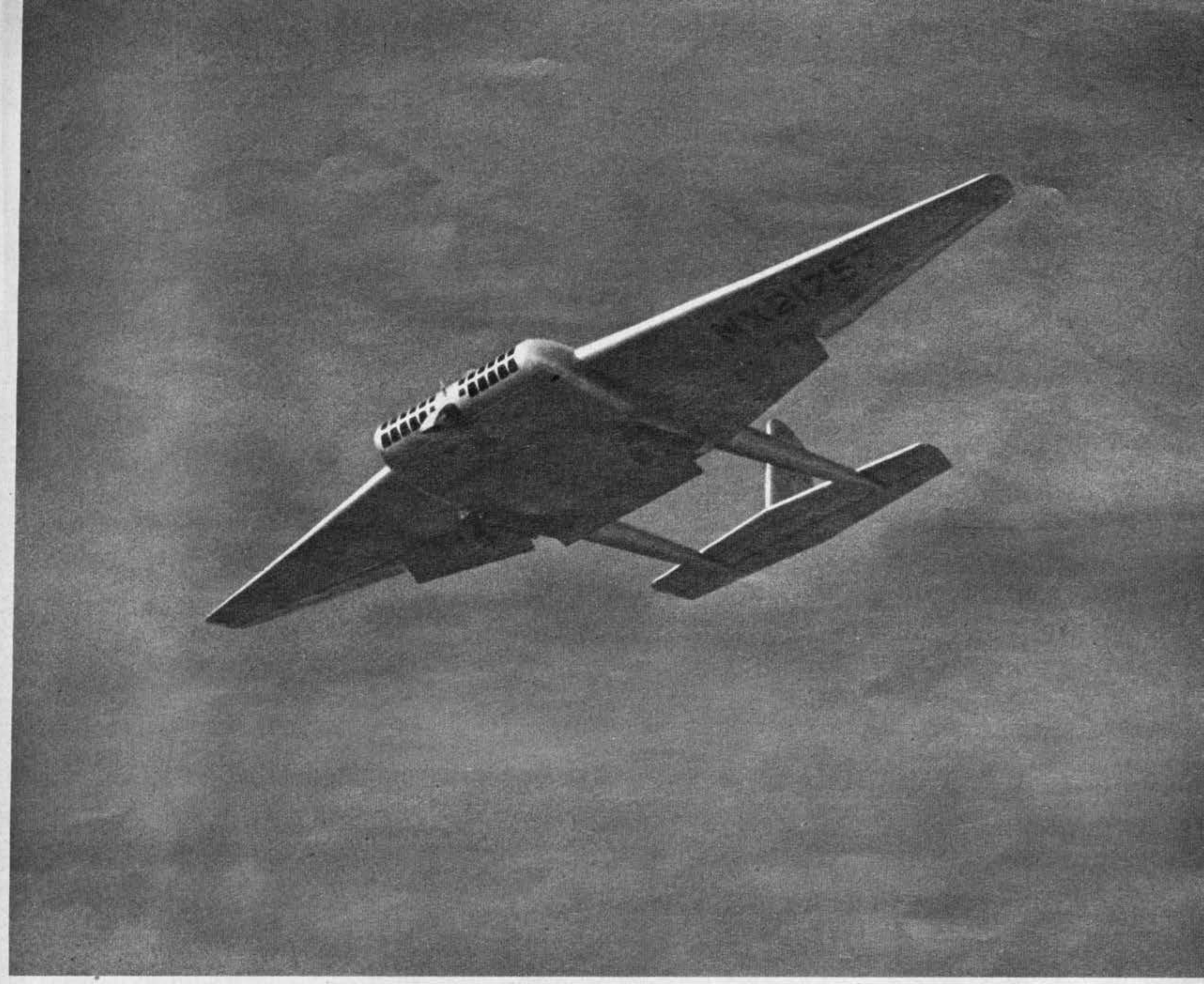
**HIGH STRAIGHT WING** and large fin curving well forward help identify CG-4A. Designed as tactical glider, it is not an ideal cargo carrier.



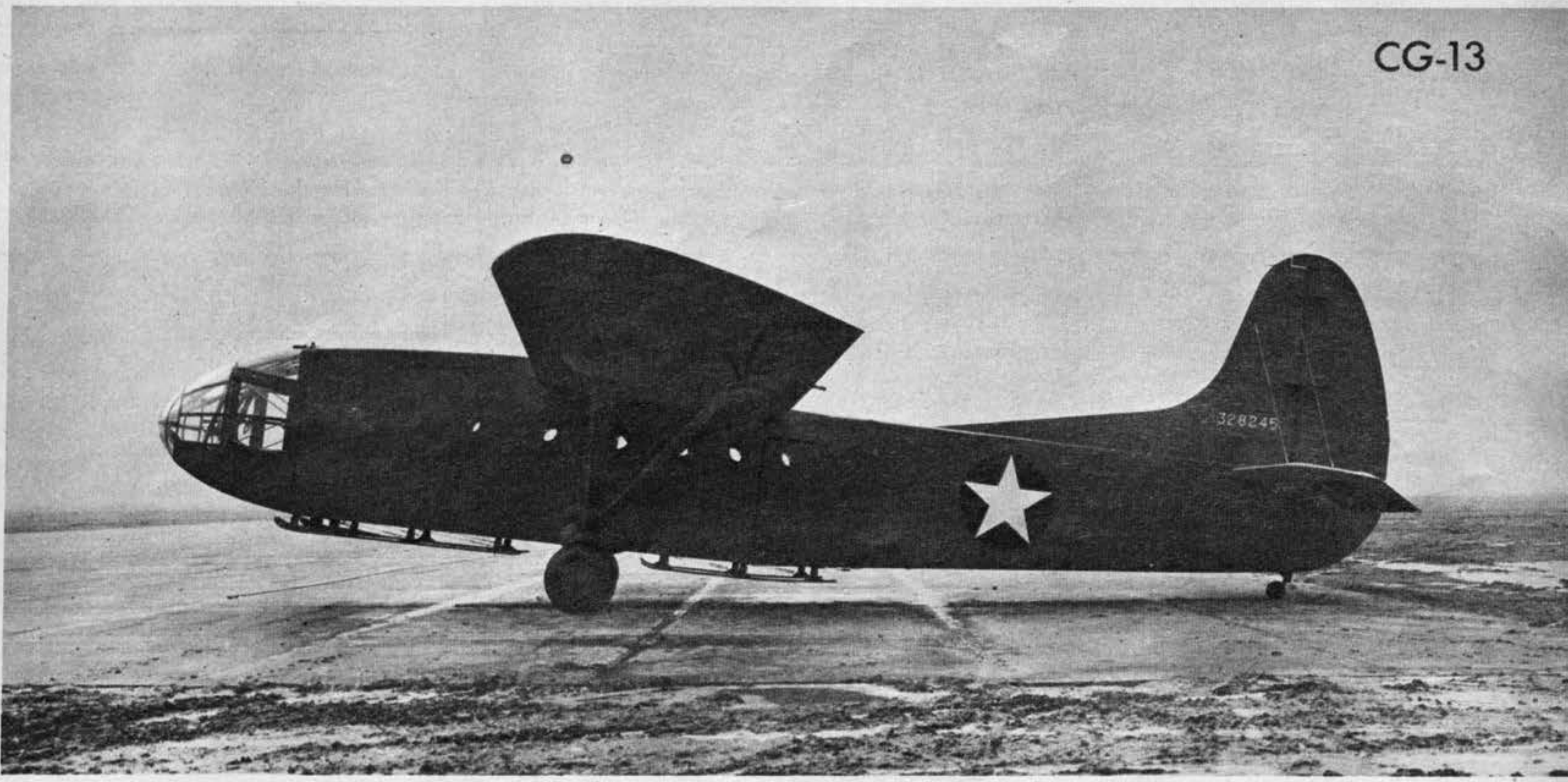
**WITH CREW OF TWO,** CG-4A can take 13 fully-armed men into battle. The load can include jeep or 75-mm. AT gun. Airflow spoilers atop wing give fast rate of sink.



**CHIEF U. S. TOW PLANE** is the famed C-47 or Skytrain here shown towing two CG-4A's. Air superiority in the locality is fundamental prerequisite for a successful glider operation. Fighters are needed for air cover before, during and after the landing to protect gliders and tugs which make up glider trains.

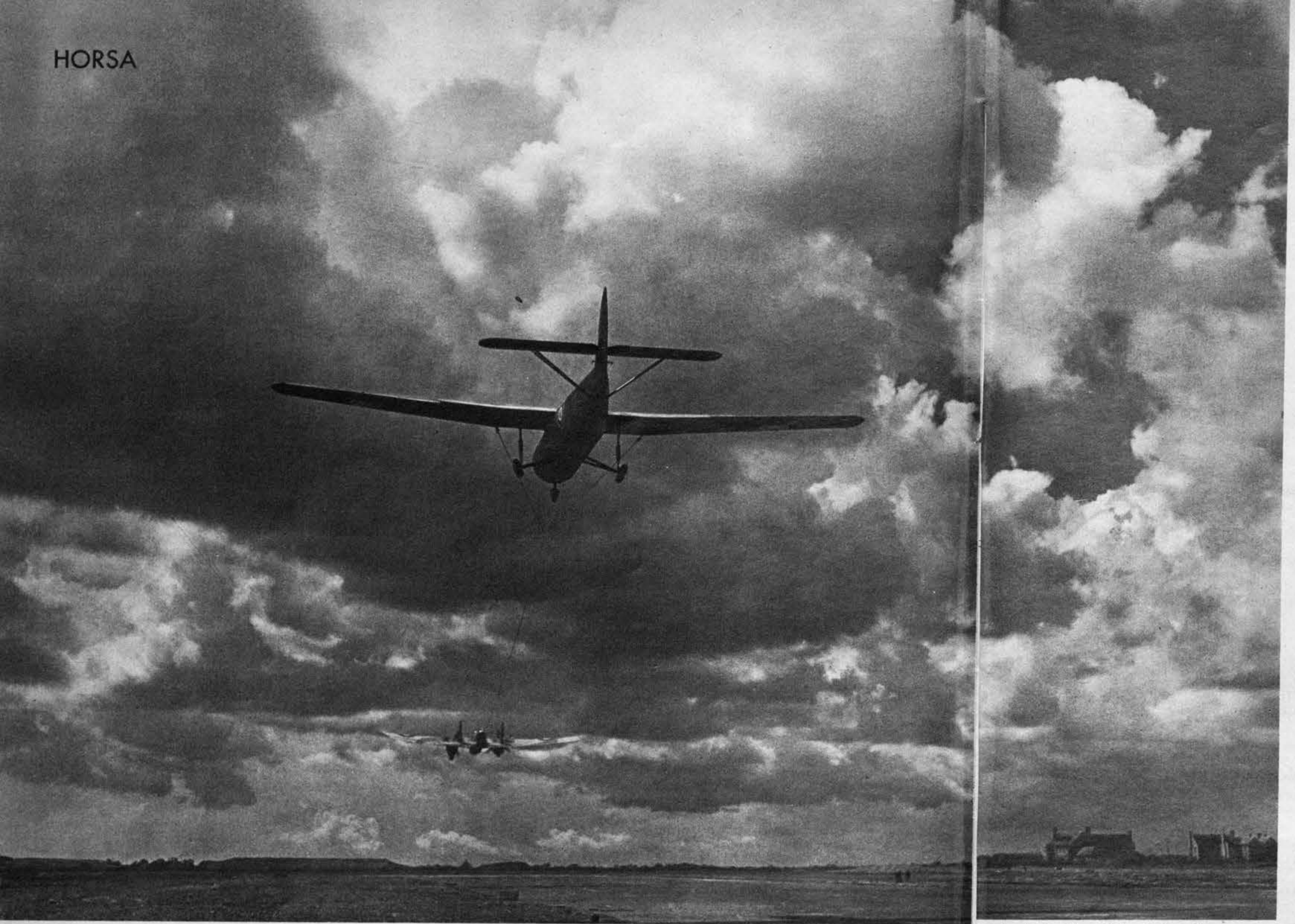


**TWIN-BOOM GLIDER,** typical example of advanced designs under development in this country, appears to be cleaner aerodynamically than many existing gliders. Both U.S. and British operational types are characterized by long bulky fuselage. Model shown above somewhat suggests "flying wing."

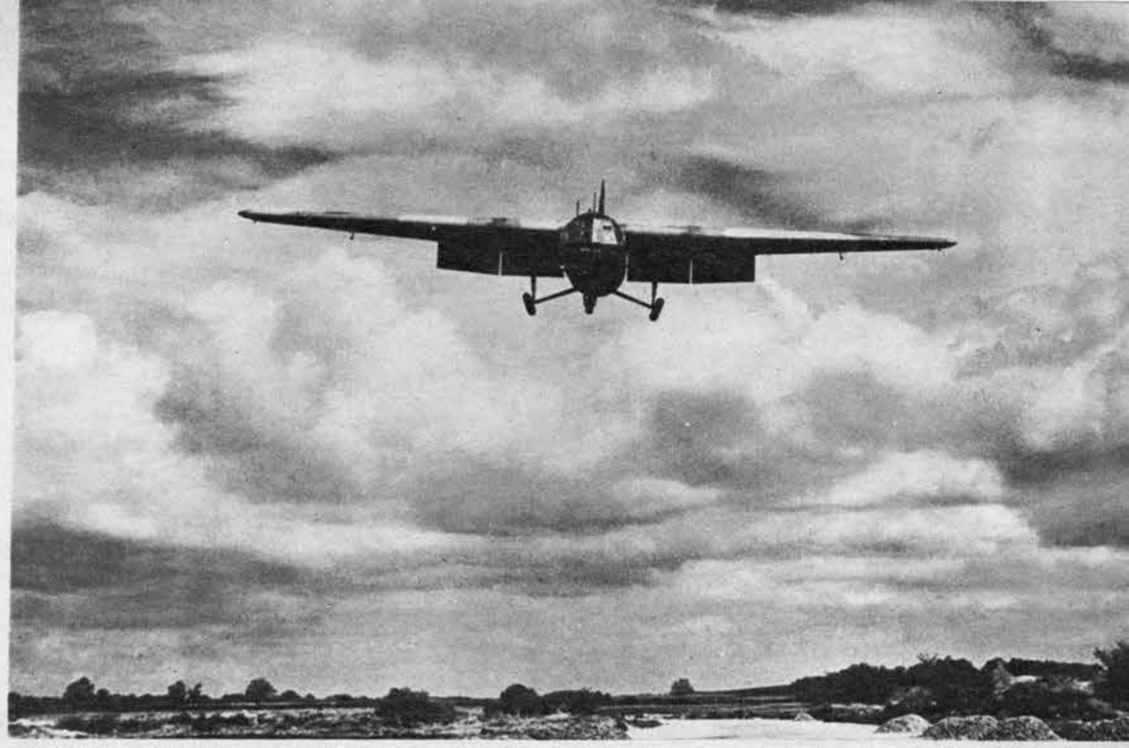


**CG-13,** called blown-up CG-4A, has same wing, but more spacious fuselage to accommodate over 2½ times CG-4A's load. Production model will have non-retractable tricycle landing gear. Able to carry a 105-mm. howitzer or 1½-ton truck, the 13 foreshadows an increased use of cargo gliders.

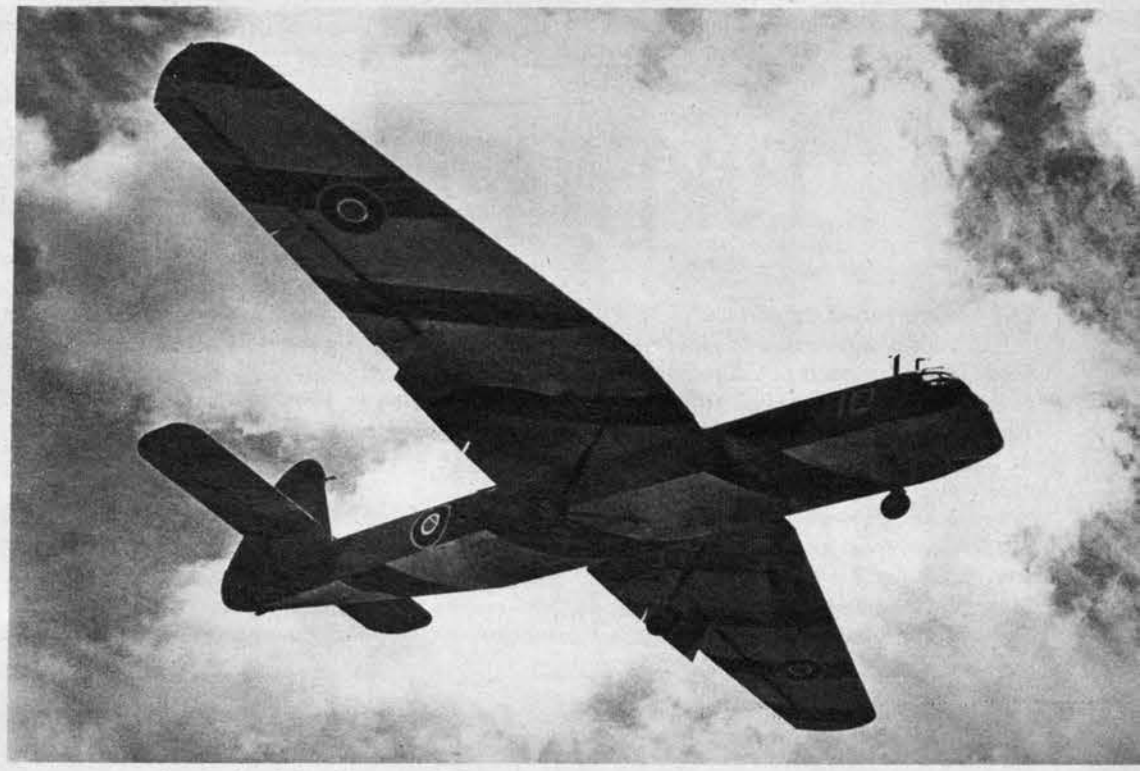
## HORSA



**AIRSPEED HORSA,** shown being towed by Whitley glider tug, is RAF's most important glider. With slightly greater wingspan than CG-4A, it is 19 ft. longer, can carry 30 men. The Horsa and Hamilcar (*below*) are Britain's only operational types at the present time, although RAF also uses CG-4A, calling it Hadrian. High tailplane, long nose are Horsa's most important recognition features.

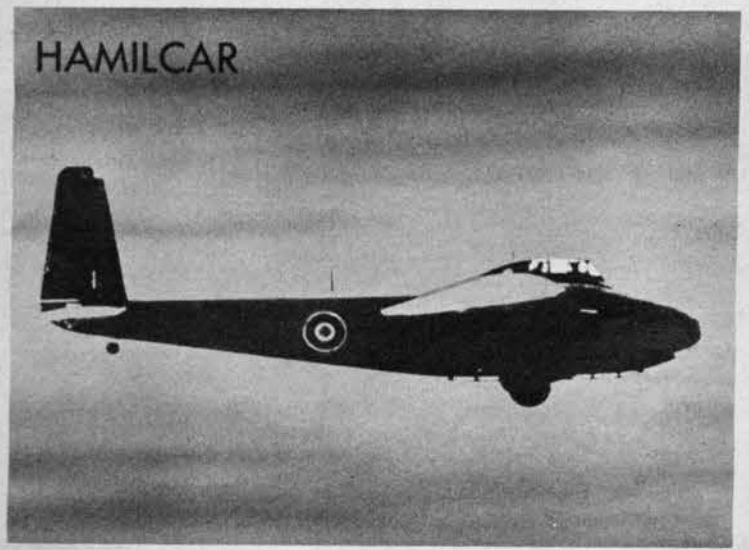


**WITH FLAPS DOWN,** Horsa can dive at a 45-degree angle. Standard practice is for glider train to approach at 100-ft. altitude to cut chances of radar detection, then climb to 300 ft. for good diving angle.

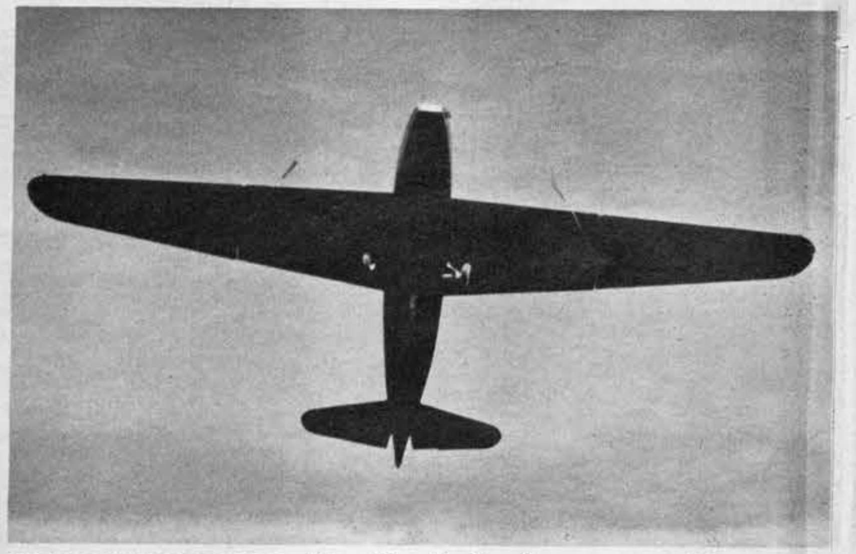


**FIRST GLIDER** to have tricycle landing gear, Horsa may also be seen without an undercarriage. Horsas were used along with CG-4A's in airborne phase of attack on Sicily for their first operational test.

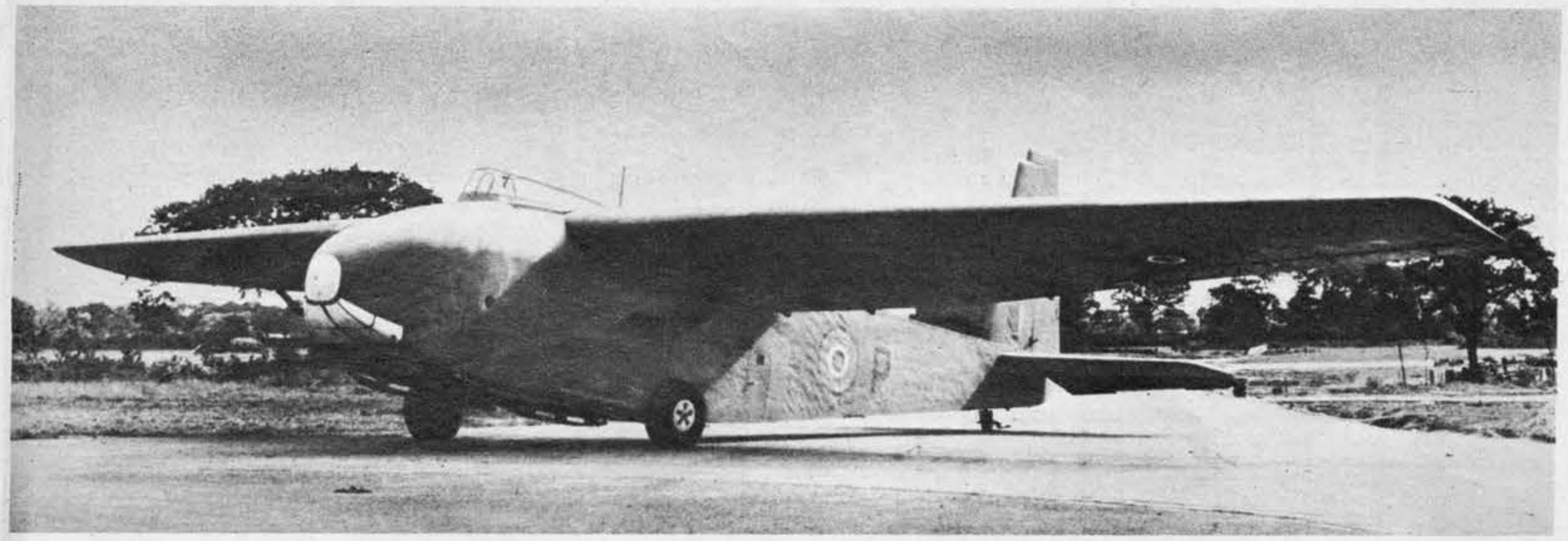
## HAMILCAR



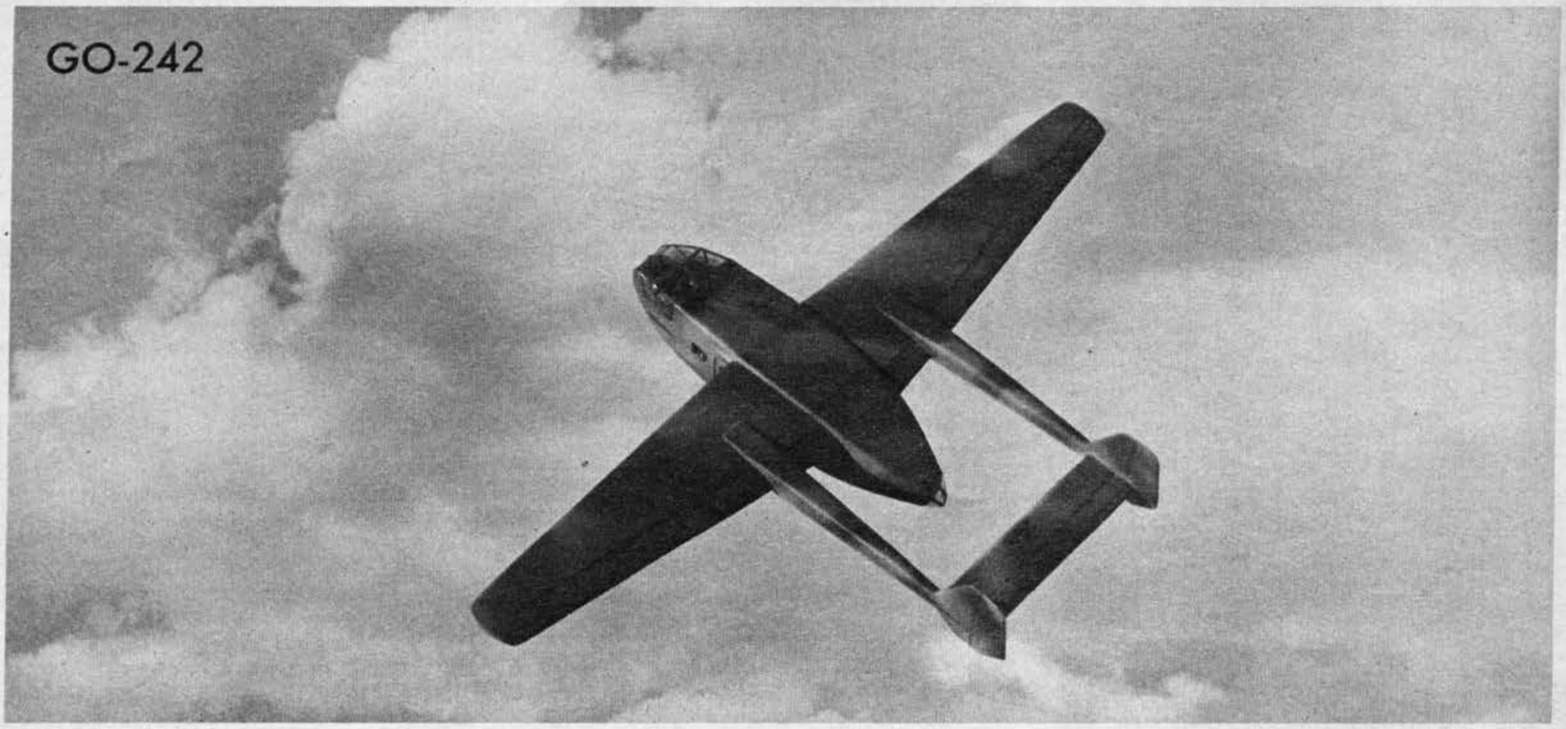
**HEAVY BODY,** huge wing, distinctive high fin and rudder serve to distinguish the Hamilcar. Undercarriage resembles that of U. S. glider types.



**BIGGEST OPERATIONAL GLIDER** of the Allies, the Hamilcar can carry airborne tank into action. About as long as the Horsa, it matches B-24's wingspread.



**COCKPIT ABOVE WING** emphasizes Hamilcar's great size. Unlike the Germans, Allied experts do not favor powering big gliders although experiments with light engines have been made on both the Horsa and the CG-4A gliders. No quantity production of these models has been undertaken.



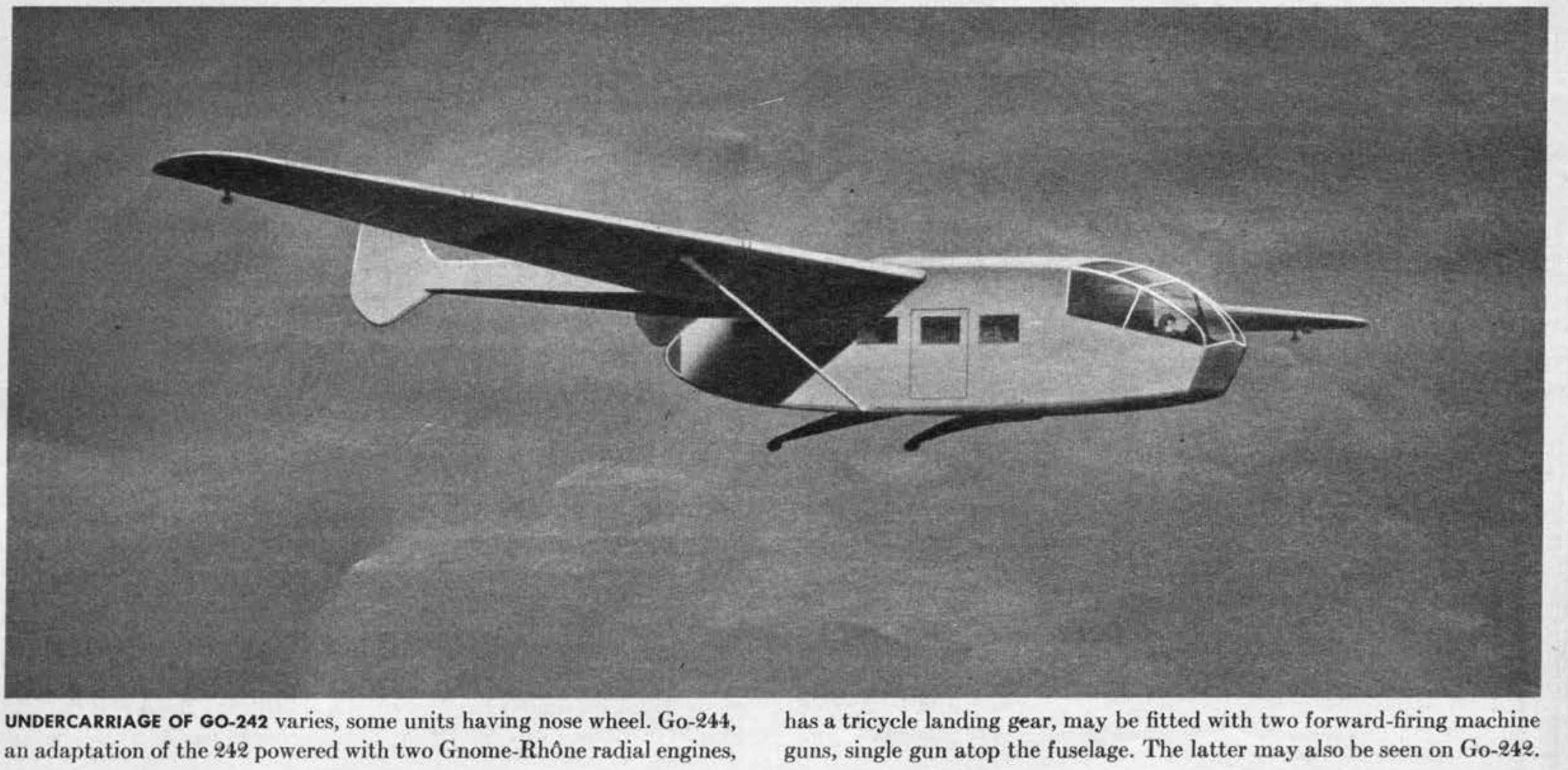
**GOTHA 242** is only twin-boom glider now in operation with either German or Allied forces. Double tail-assembly is therefore an outstanding recognition feature. Bulky freight is loaded through rear of heavy gondola. The glider's capacity is 23 soldiers with full equipment, or 5,300 lb. of freight.

# LUFTWAFFE'S GLIDER FORCE

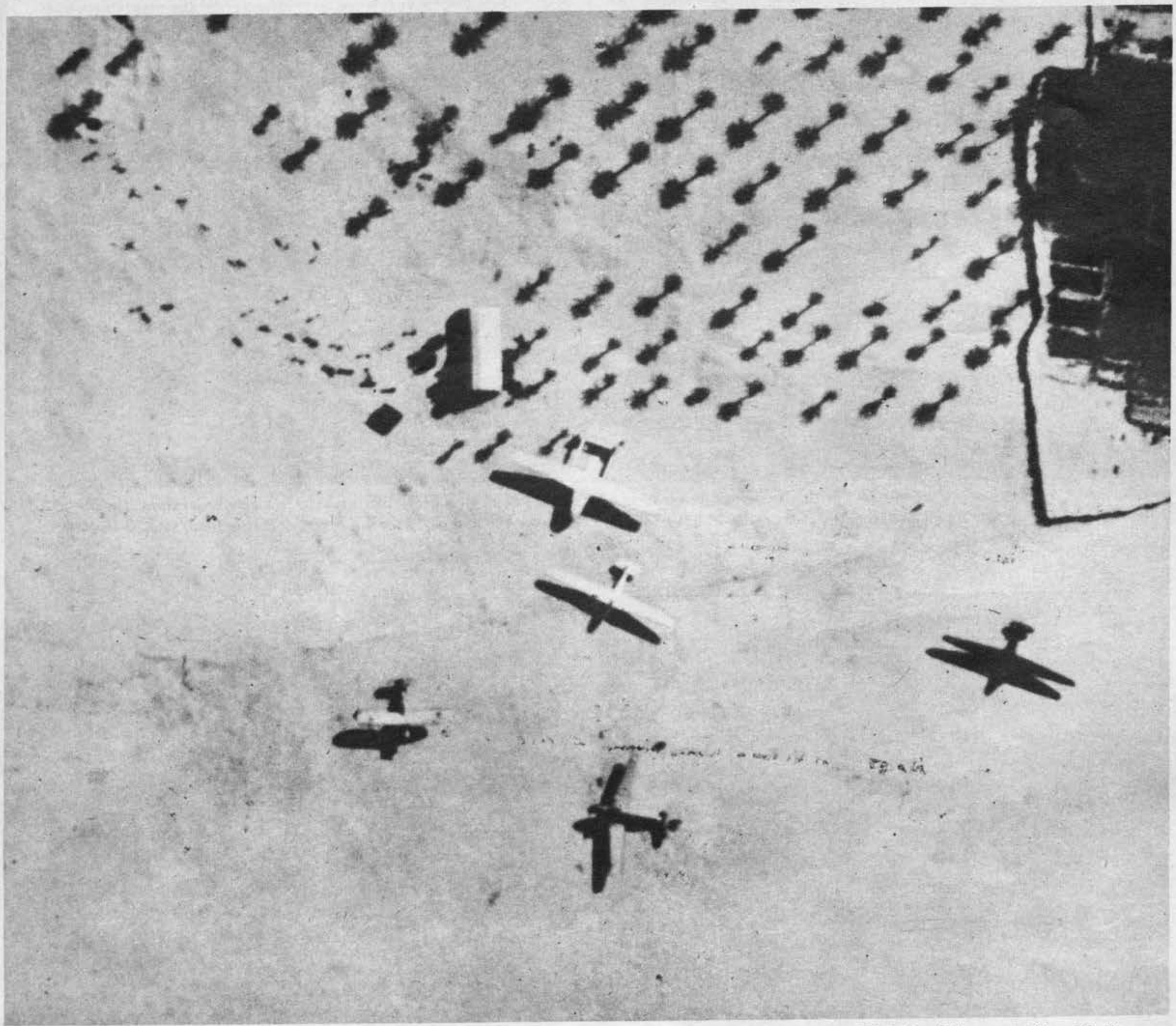
World's greatest exponents of sport gliding, the Germans have taken full advantage of their civilian experience in the military field. In two important campaigns, the Low Countries and Crete, gliderborne thrusts paved the way for decisive victories at Fort Eben Emael and Maleme Airport. In Tunisia and more recently in Russia, glider trains have become a major asset in bolstering shaky supply lines.

Some 70 DFS-230's (*see opposite page*) towed by Ju-52 transports were used in the descent on Crete. Made of wood, many were badly mauled both in the air and when making rough landings. Nevertheless, they did manage to land successfully and in force in one place, a river bed near Maleme Airport. Joining the parachutists already on the field, the glider troops clinched its possession. Crash landing Ju-52's on the battered airdrome, the Nazis poured in men and equipment in sufficient numbers to conquer Crete despite heavy losses in the invasion's seaborne phase.

When large bodies of German troops have been cut off as in Tunisia, at Stalingrad and in the Cherkassy pocket in the Ukraine, the Germans have turned to air transport, have used Me-323's and Go-244's (powered Go-242's) and DFS-230's to supply their trapped armies. Working at short range, they evidently find these slow but cheap craft useful. Since Allied air transport, on the other hand, covers distances far too great for powered gliders, it is usually in a less favorable position for development paralleling that of the Nazis.

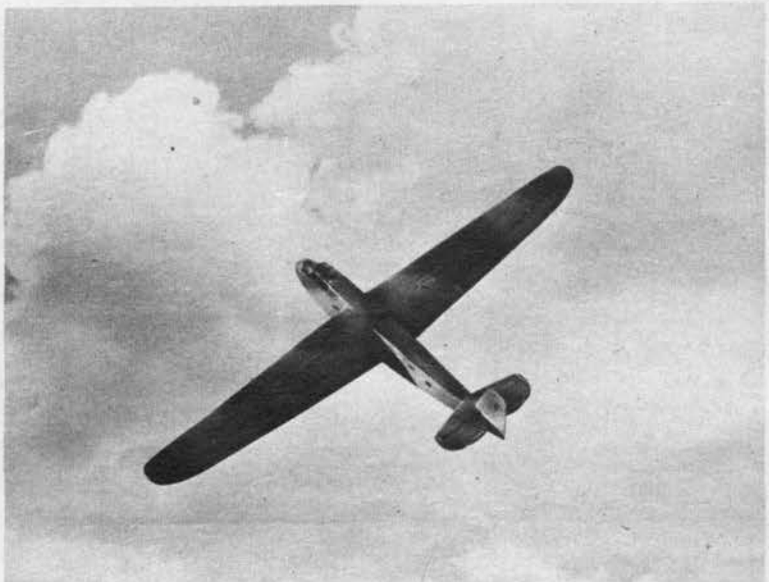


**UNDERCARRIAGE OF GO-242** varies, some units having nose wheel. Go-244, an adaptation of the 242 powered with two Gnome-Rhône radial engines, has a tricycle landing gear, may be fitted with two forward-firing machine guns, single gun atop the fuselage. The latter may also be seen on Go-242.

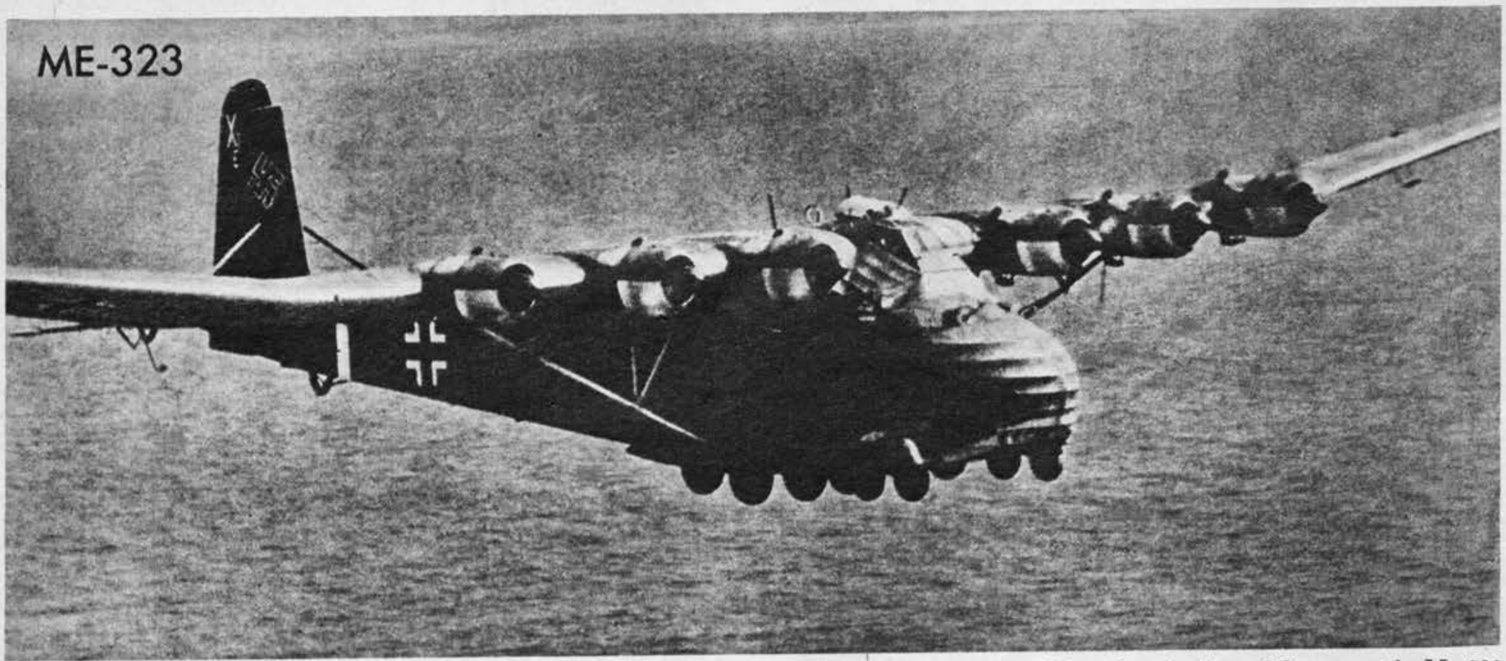


**PARKED ON LIBYAN AIRDROME,** three Nazi gliders can be seen along with two airplanes, a Hs.126 (*left*) and a FW-58 (*right*). Twin-boom glider is Go-242, others are DFS-230's. With the Allies controlling Mediterranean, German transport made regular use of gliders near campaign's end.

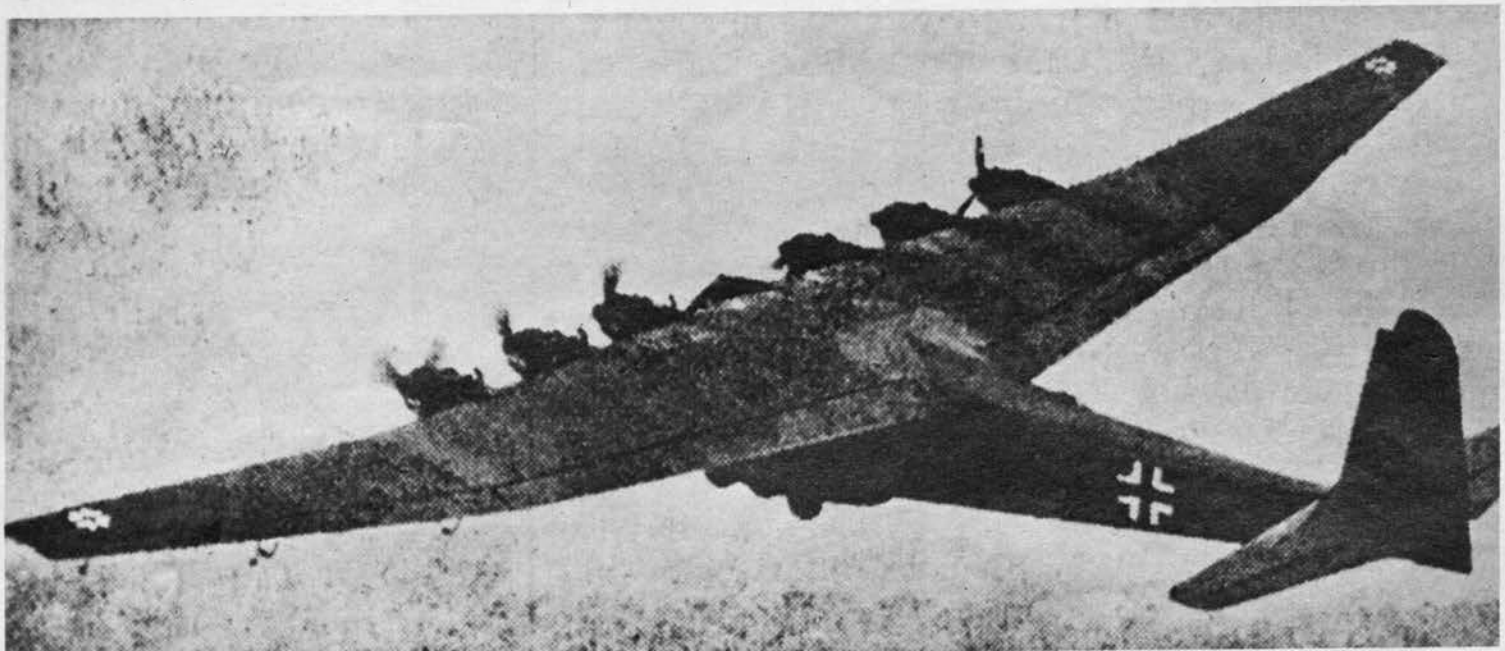
**DFS-230,** standard German glider for assault on Crete, is the smallest operational glider now in use. Rough landings wrecked many in Crete attack.



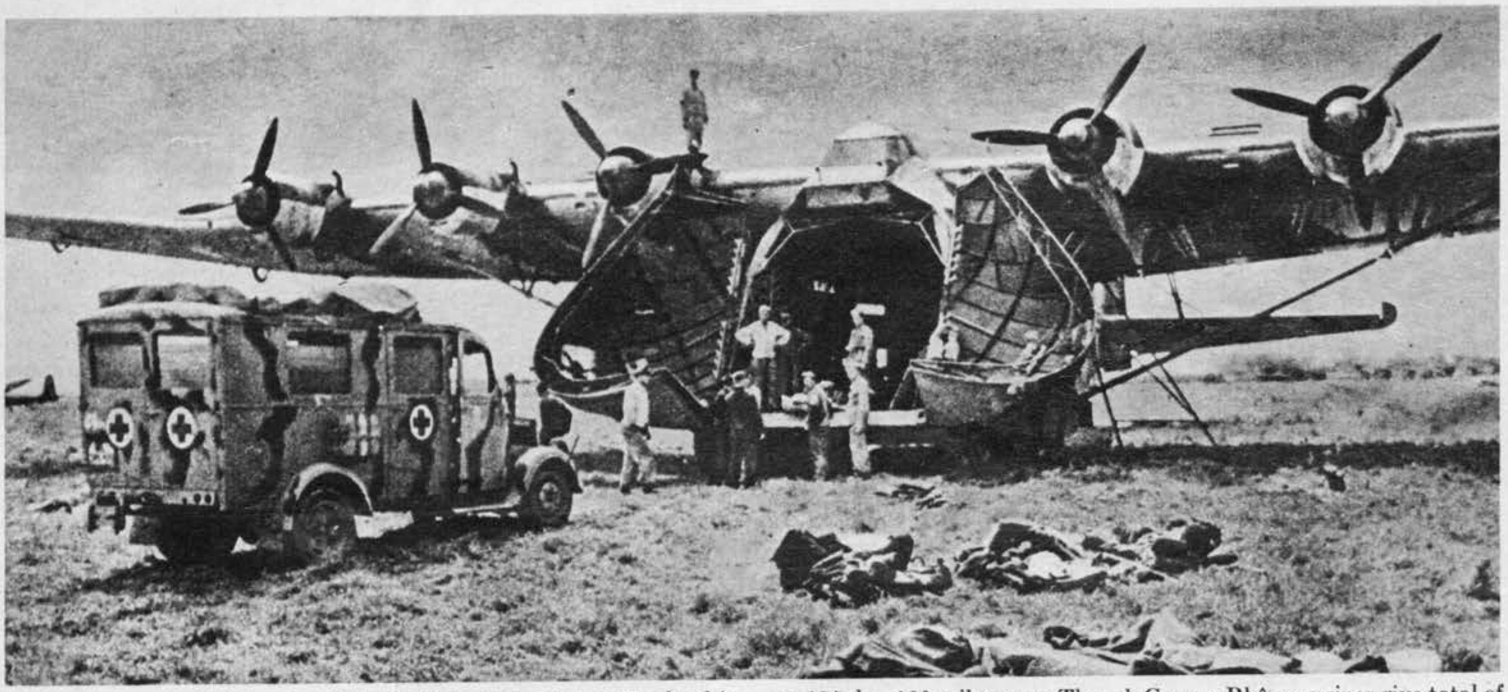
**SAILPLANE'S GRACE** is approached by DFS-230 more than by any other military type. Note glider's large wingspan, broad tailplane and angular rudder.



**MESSERSCHMITT 323** is an aerial monstrosity with six engines, ten wheels to handle immense weight. Developed from the Messerschmitt 321 glider, first observed on a field at Merseburg in Central Germany, the Me-323 can carry 130 men or 18 tons of cargo including small tank, 3-ton truck.



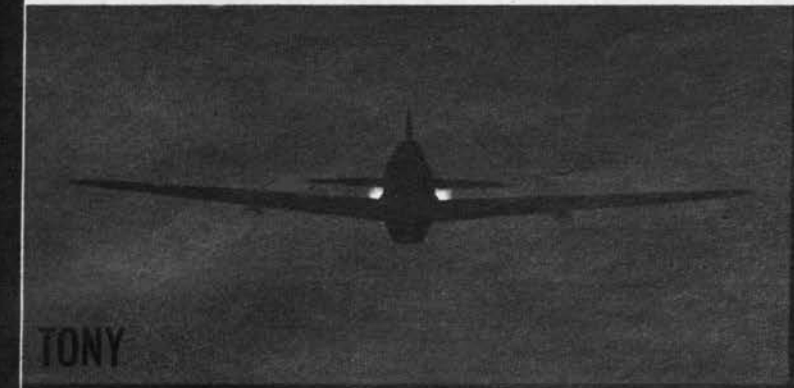
**SLOW AND VULNERABLE,** Me-323's were butchered trying to evacuate troops from North Africa. It is, however, being produced in increasing numbers, particularly for the Russian front to counteract poor ground communications. Plane now has armor for crew, may carry up to 18 machine guns.

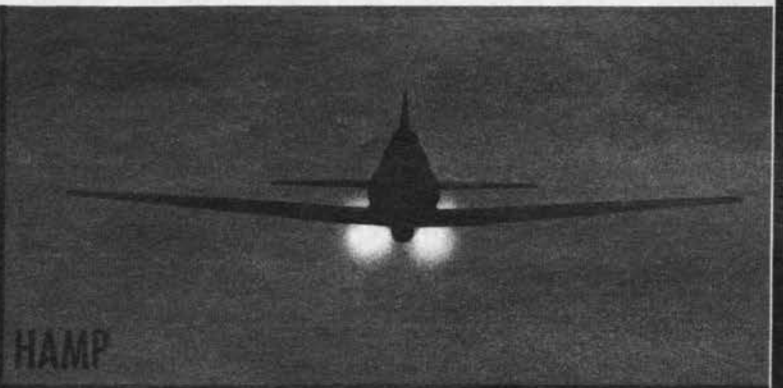


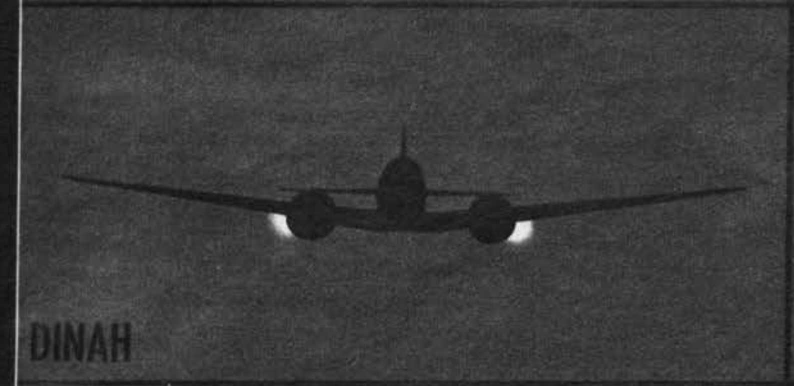
**MAW OF Me-323** opens to receive its load. Claimed by Germans to be the largest land plane in the world, it has a top speed of 190 m.p.h., cruises at 135, has 500-mile range. Though Gnome-Rhône engines give total of 5,790 h.p., fully loaded Me-323 needs rockets for assistance at take-off.

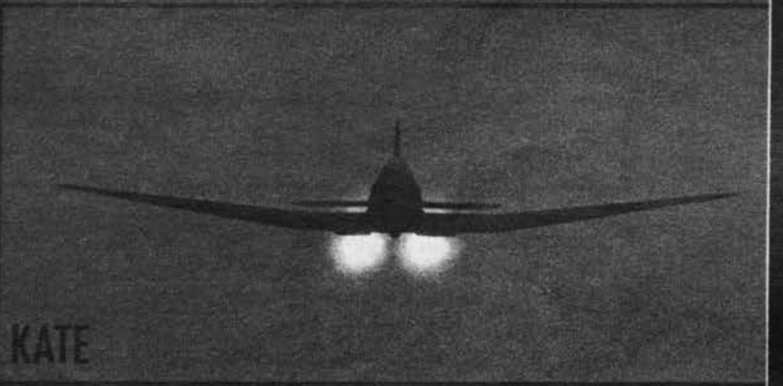
# JAP PLANE EXHAUSTS

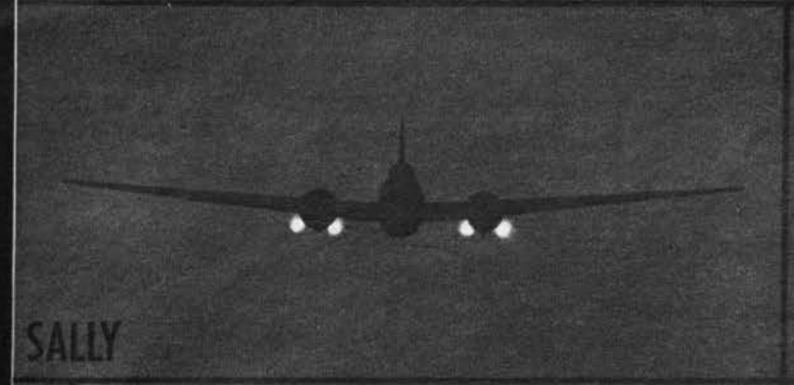
The renderings below show marked resemblance of flame patterns cast by Hamp, Kate, Oscar and Val—indicating exhausts on either side of lower cowling slightly forward of and below the leading edge of wing. Oscar's fuselage is more completely framed by its exhaust pattern; Tojo's double flame is cast much higher than the other single-engine double exhausts. The new fighter plane Tony throws long narrow flames high to the rear. Twin-engined Dinah and Nick have a single exhaust per engine outside each nacelle; whereas Sally and Betty throw theirs on each side of each nacelle—Sally's show below the engines while Betty's show above.

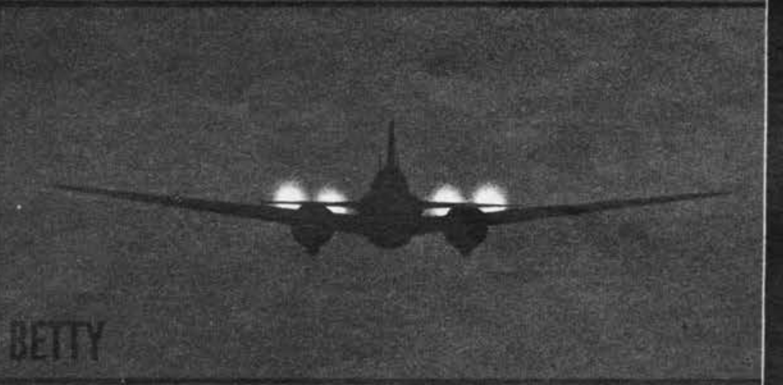

TONY

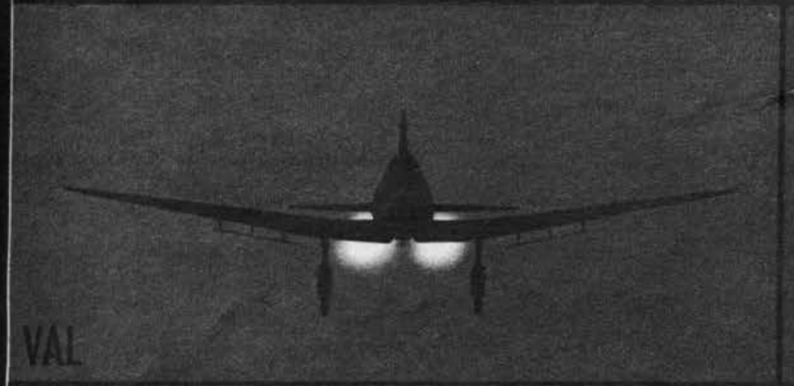

HAMP

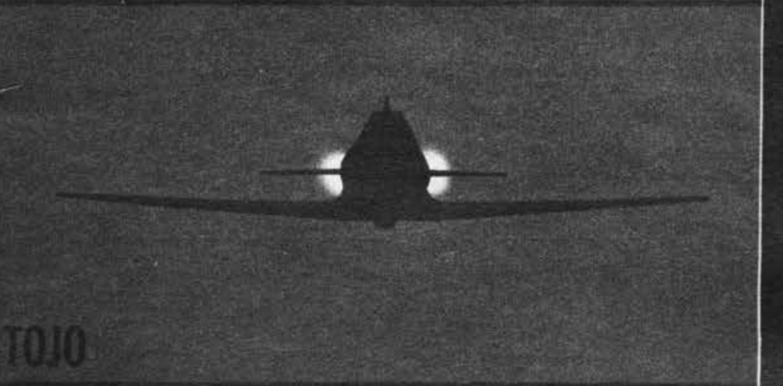

DINAH

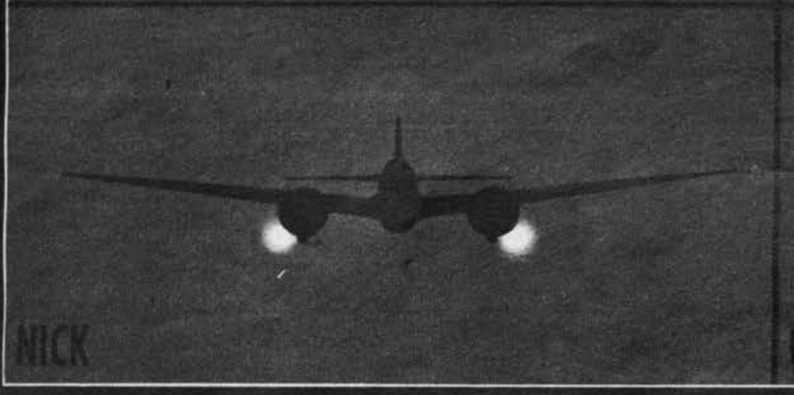

KATE

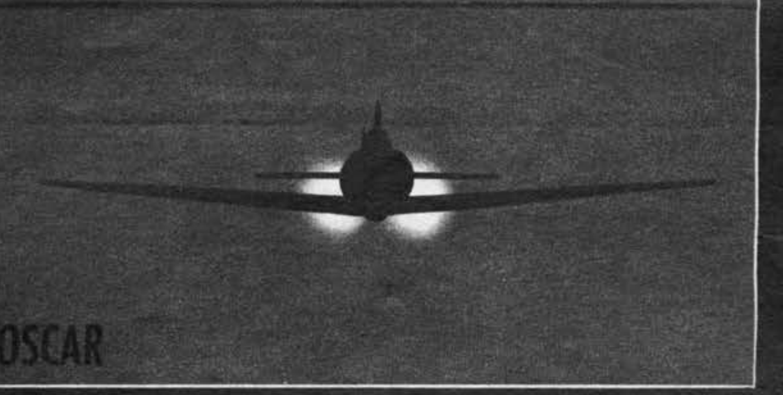

SALLY


BETTY


VAL


TOJO


NICK


OSCAR

# THE BRITISH ARMORED CARS

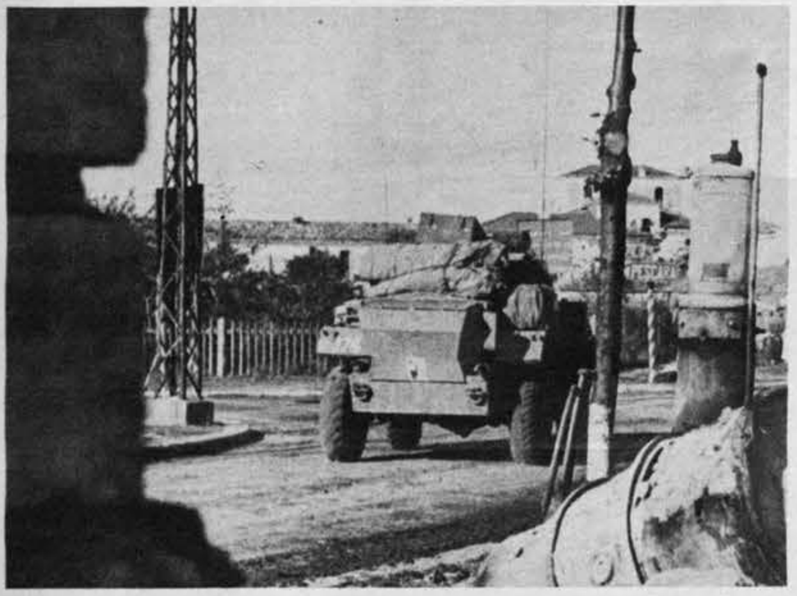
## Backbone of the Reconnaissance Corps, they cover much ground, scout out enemy forces

Armored cars are the most important vehicles of the British Reconnaissance Corps which carries on the traditional role played by the cavalry in earlier wars. Their job is to gather information on the strength and disposition of enemy forces in the field, on his movements and on the surrounding terrain. A company of armored cars may advance many miles into enemy territory, overcome small resistance or set up a screening operation to conceal the advance of their own forces.

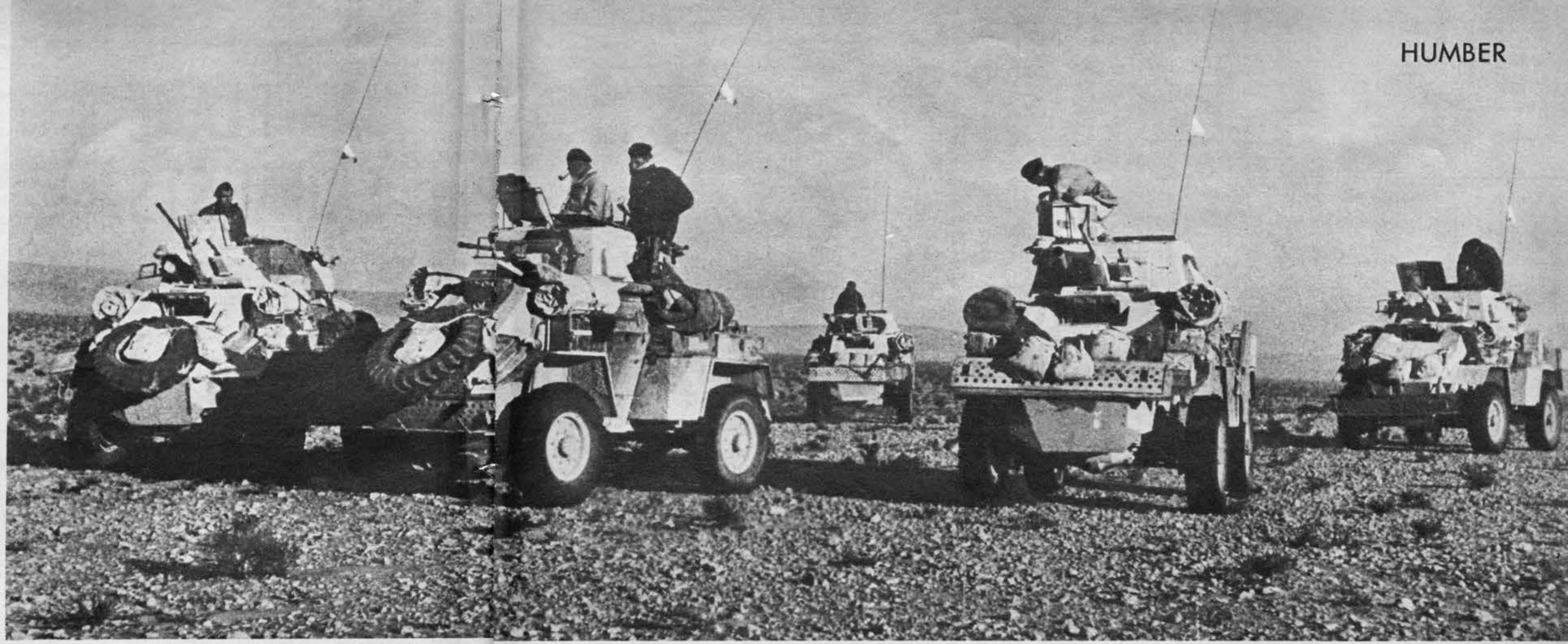
These vehicles are built for speed and have enough striking power to fight for information if necessary. They carry antitank and antiaircraft weapons, machine guns, mortars, smoke ejectors, have radio equipment to keep in touch with the rear divisions.

Crew members of an armored car battalion are carefully picked men. Each one is capable of taking the initiative in the absence of superior officers. Each is rugged and a Jack-of-all-trades. The long trips on scant rations, days spent in concealment within enemy lines, difficult river and mountain crossings test their physical endurance. The job at hand may call for signaling, map-reading, field-engineering, auto mechanics, demolition, and mine-clearing, as well as gunnery. In France, the Western Desert, Tunisia, Sicily and Italy, the success of many battles has depended upon the skill and resourcefulness of these men who tip off their own forces to the enemy's intentions.

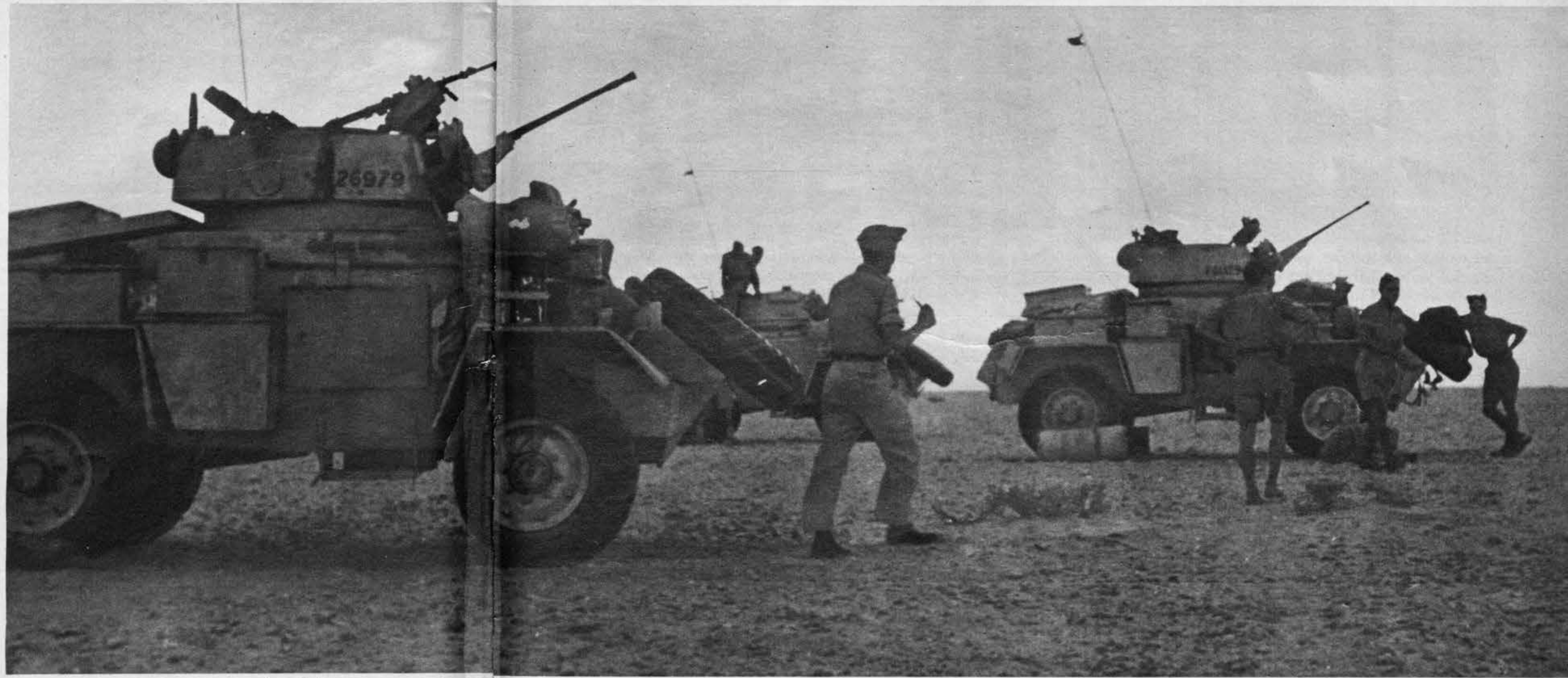
The six principal British armored cars here look very much alike. All have four truck wheels, a short wheelbase and a stocky appearance. Hulls have many angular sloping surfaces and mount a multitude of gadgets; prominent mudguards are wide and high-set. All but the Lynx have an angular turret on top of a raised center hull section.



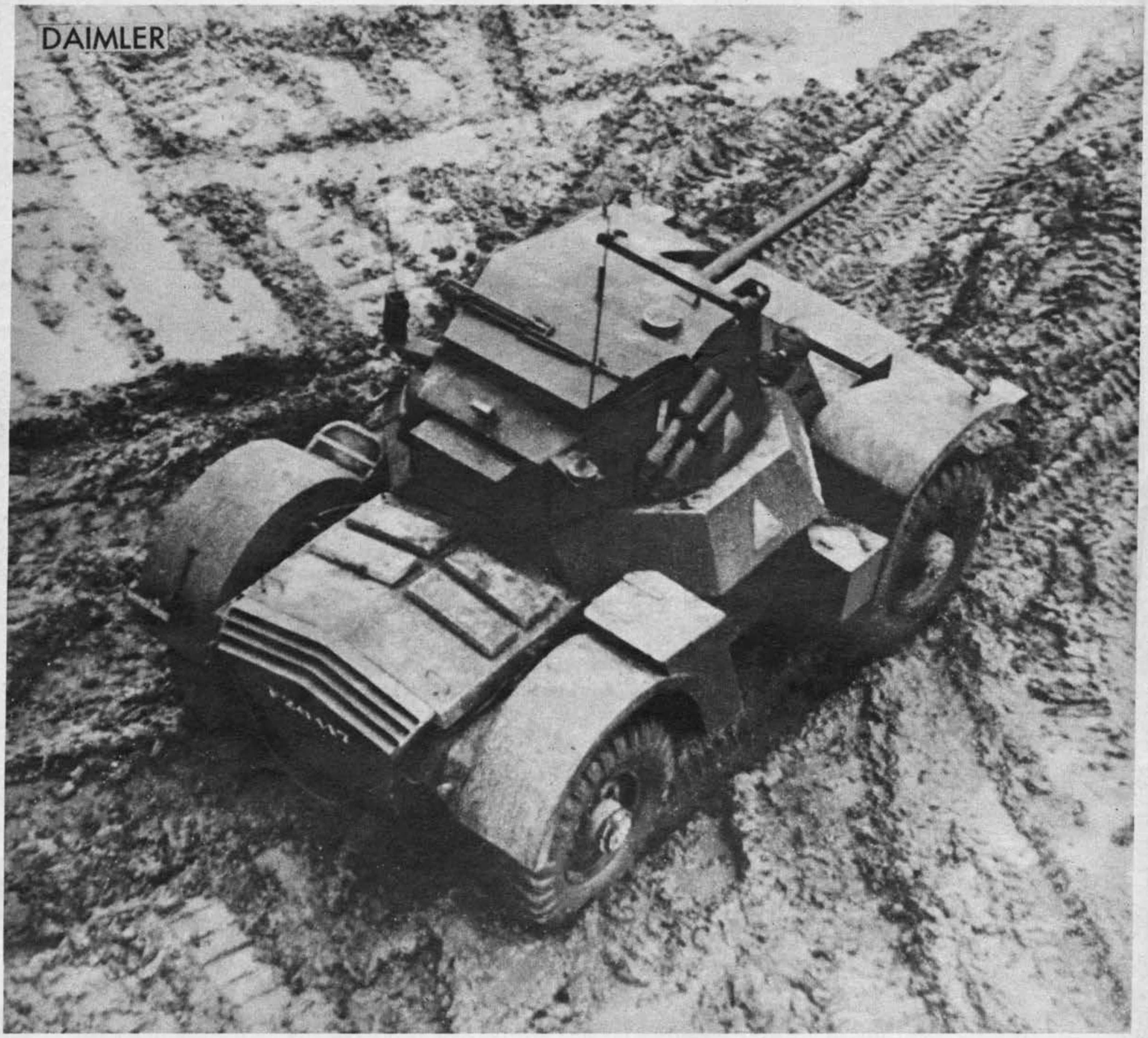
**THROUGH PESCARA, ITALY,** on the Adriatic Sea, a Humber proceeds in advance of Montgomery's Eighth Army. Its turret is hidden by tenting and equipment. Large tool box juts out beyond wheels at rear. Mudguards are broad and high.



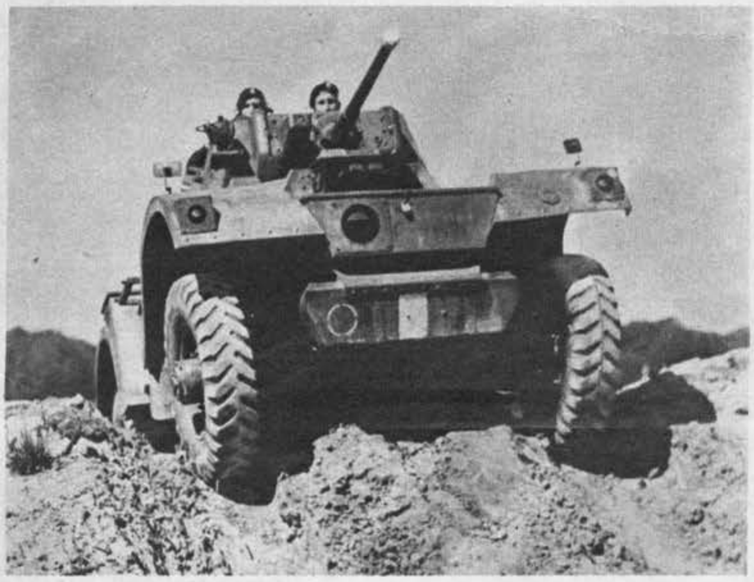
**A GROUP OF HUMBER ARMORED CARS** prepares for a reconnoitering expedition behind enemy lines in the Libyan Desert. Fuel cans, crew's supplies and camping equipment are piled on all available surfaces of the vehicles. In this head-on view the angular bow of the Humber projects well beyond front wheels; the hull slopes up in back toward a flat-topped, squared-off turret. Driver's cab is situated very prominently halfway up the abrupt slope of the hull face. Spare tire rides in front on the bow. Four of five cars shown above have a front fender used as luggage carrier. Total weight of Humber is only 8 tons; speed, 45 m.p.h.; heaviest armor, ½ in.



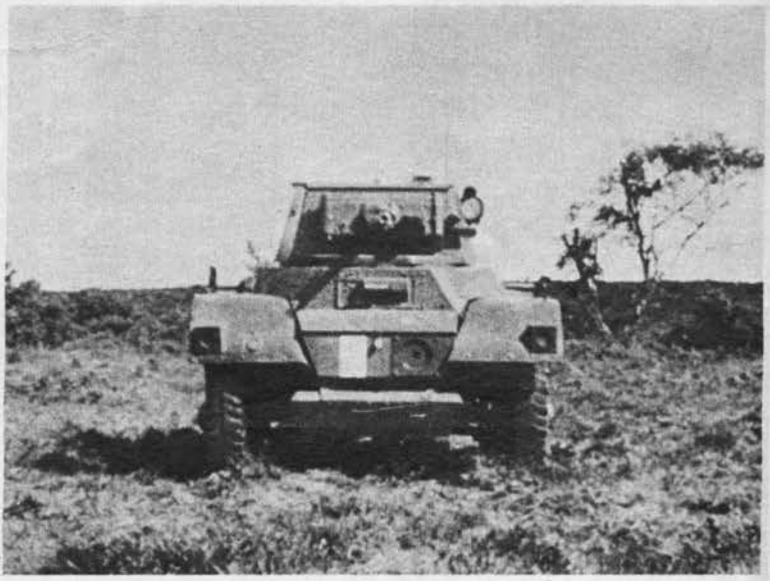
**THE FOUR-WHEELED HUMBER** armored car has distinctive square mudguards and a short wheelbase. In profile the bow of the hull juts out to a point in front, and the rear of the hull projects beyond the wheels in back. Front and back of hull incline toward a turret that is shallow, squared-off and undercut at back. The Humber carries a heavy machine gun mounted coaxially with a light machine gun in the turret. A Bren antiaircraft gun and a sub-machine gun are also carried. The Humber has a crew consisting of driver, gunner and commander-loader. In North African campaign, armored car crews captured a number of Nazi paratroopers.



**THE DAIMLER ARMORED CAR,** product of a famous English automobile factory, has made a fine record with the British Reconnaissance Corps. Much of its success is due to its fluid drive, a feature patented by Daimler long before it was used in U. S. autos. The Daimler drive has proved sturdy and dependable and reduces the likelihood of stalling in sand and mud. The car has a speed of 45 m.p.h. and can be steered from the rear for quick reverse.

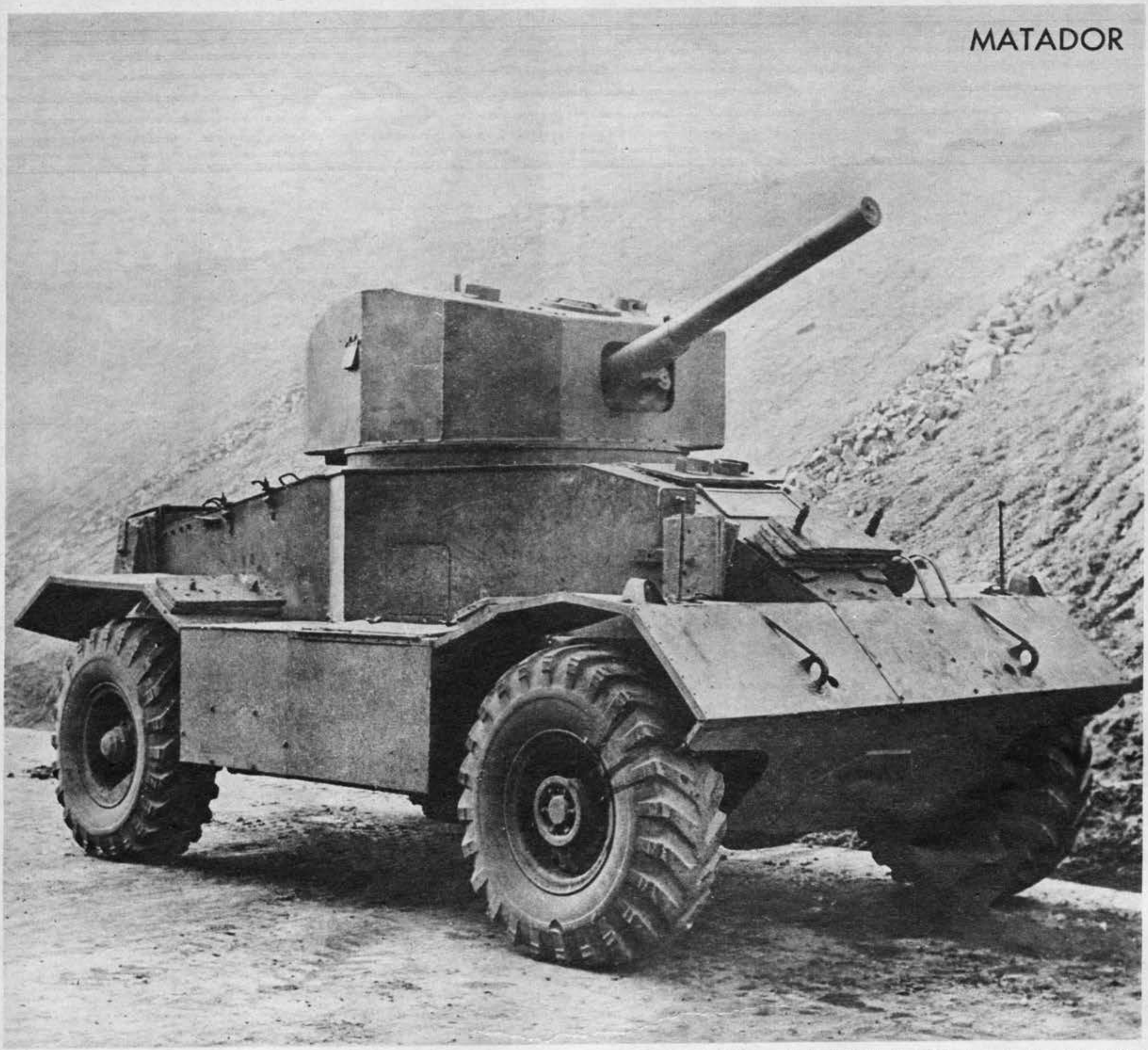


**BROAD CHASSIS OF DAIMLER** furnishes stable platform for long-barreled 2-pounder mounted in rectangular gun mantlet. Curving mudguards are set high, leaving wide gap between them and four conventional truck wheels.

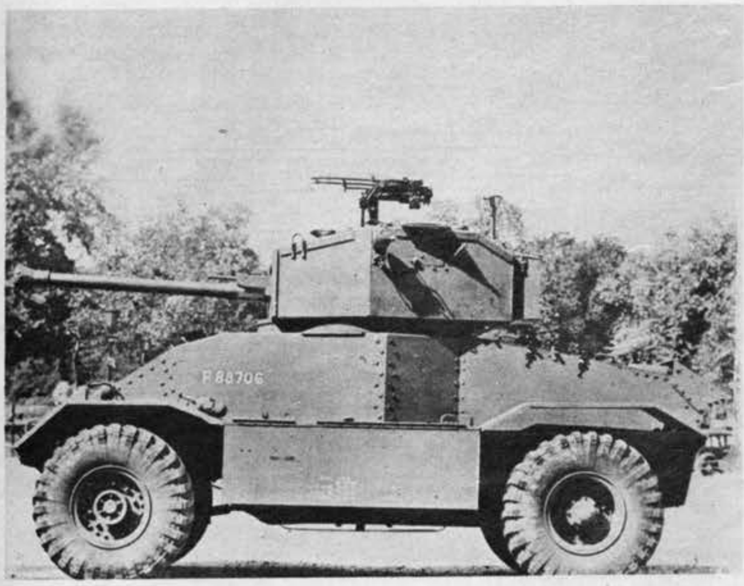


**HEAD-ON THE DAIMLER** shows a flat bow, hull sides that incline toward turret. The face of the turret is rectangular, receding slightly. Total effect of Daimler is of an underslung, teakettle-shaped hull wedged in by four large wheels.

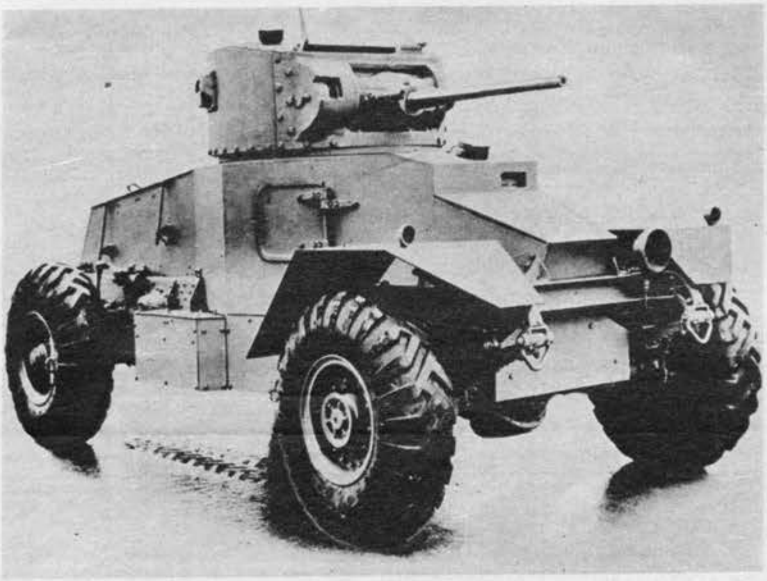
# MATADOR



**THE DIESEL-ENGINED MATADOR (A.E.C.),** one of the largest armored cars in use today, weighs 13½ tons. Its great size and weight make it unsuitable for reconnaissance in close, hilly country, but good for the sandy, muddy, open country of North Africa and the Middle East. Equipped with a 6-pounder weapon (muzzle brake not shown) and armor plate 2 in. thick, the Matador is an excellent supporting vehicle and can perform the duties of a light tank.

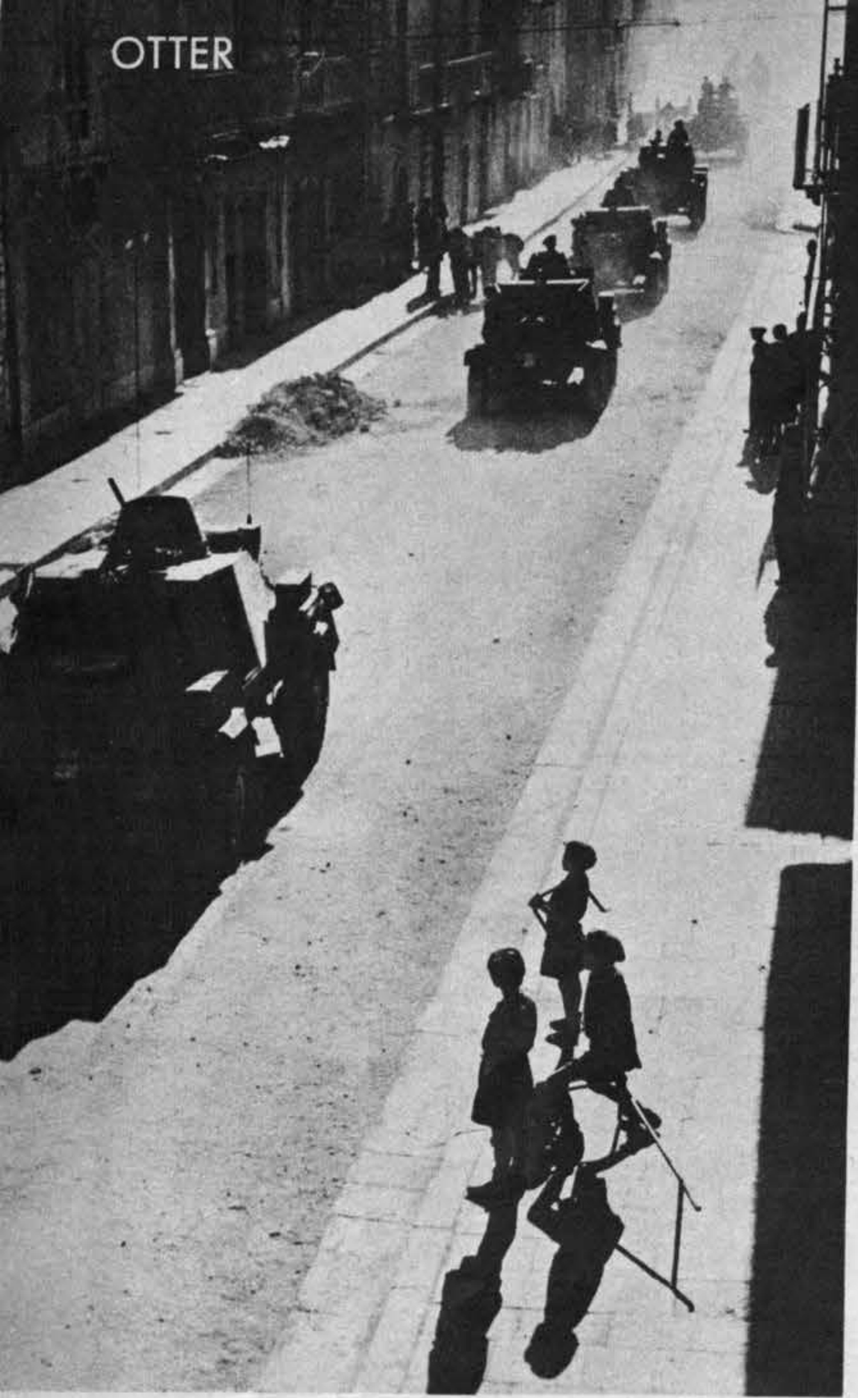


**MATADOR HAS HIGH SILHOUETTE.** Hull slopes front and back. Sides of hull are sharply vertical and pinched in toward the back. New 6-pounder gun has muzzle brake not shown in top picture. On turret top is .30-cal. AA gun.

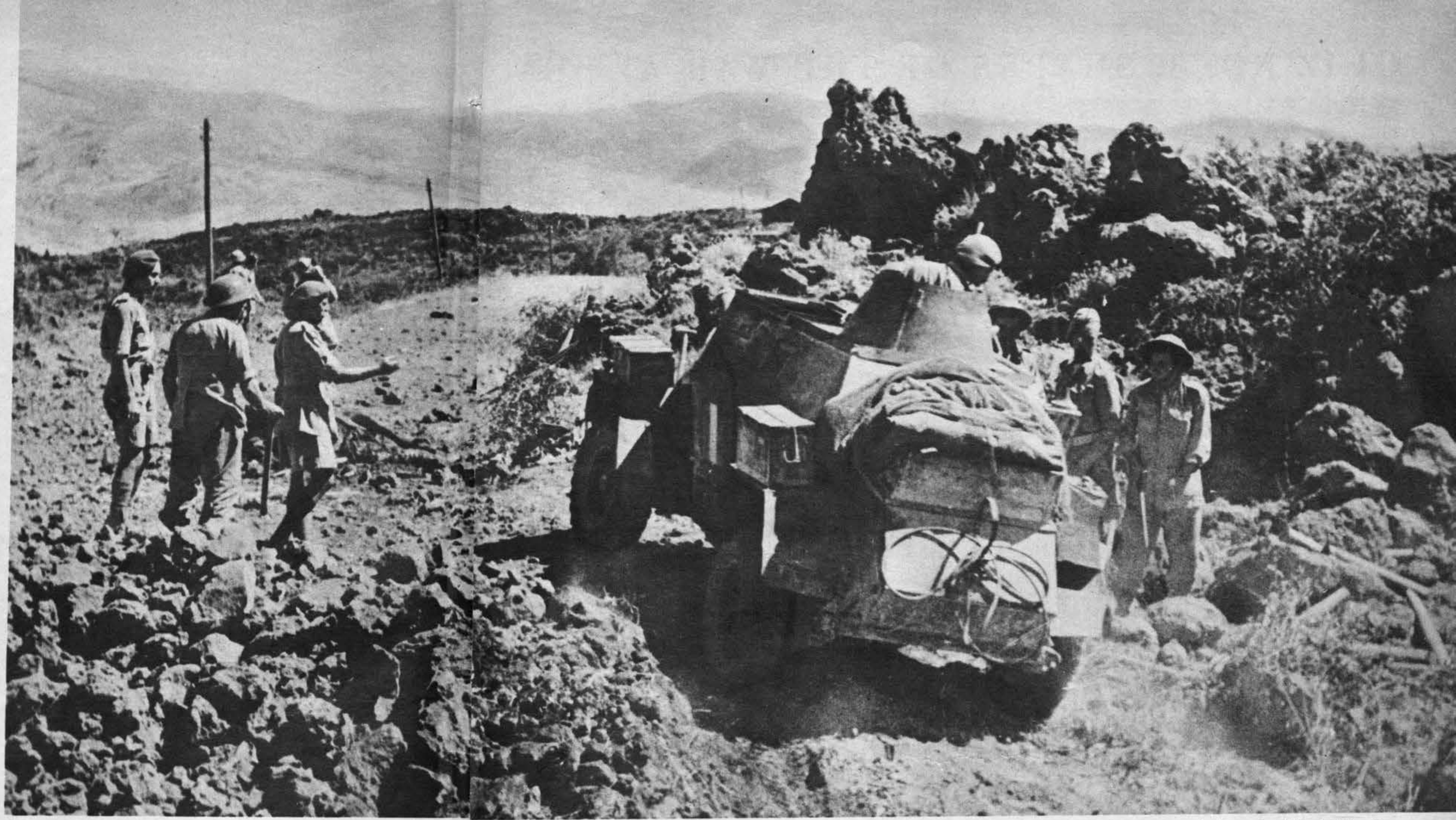


**MATADOR WITH 2-PDR.** weapon also mounts a coaxial .30-cal. machine gun. Turret bulges to front and rear and appears more cylindrical than the other two Matador turrets shown on this page. Bow of hull tapers toward front.

## OTTER

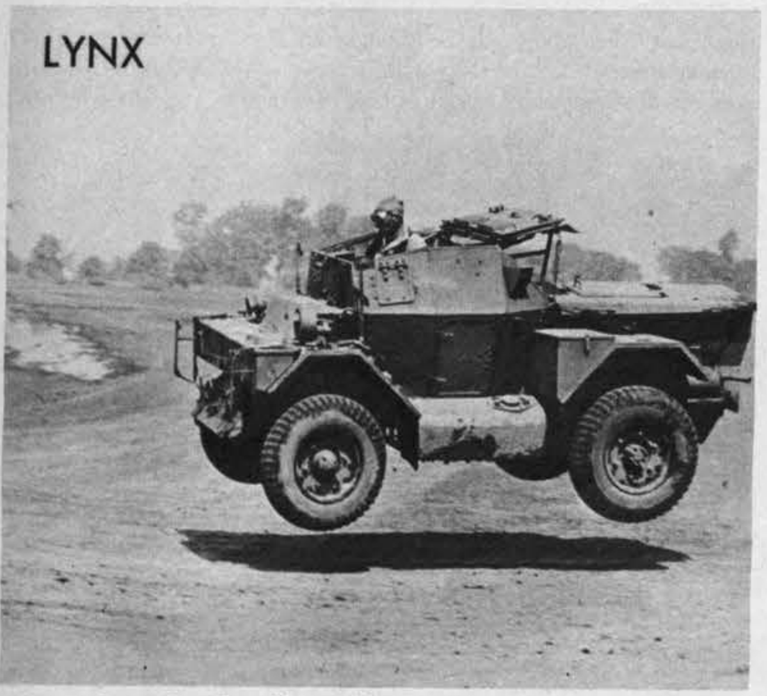


**THE CANADIAN OTTER, ARMORED CAR** (*foreground*), rolls down a street in Sicily. During the campaign it played no small part in the capture of the island. Quick recognition feature is open-topped conical, stovepipe turret.

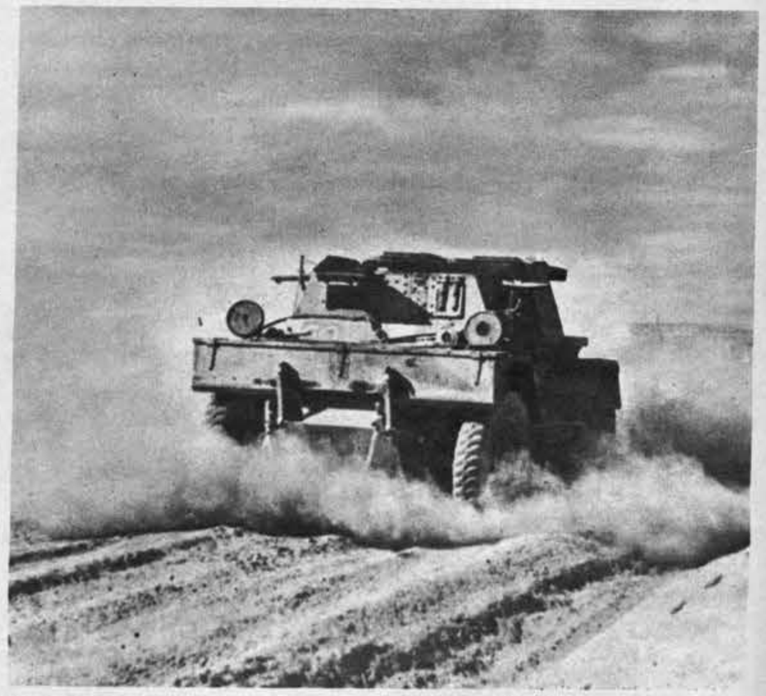


**THE OTTER ARMORED CAR** can be found wherever Canadian troops are in action. It was designed and built in Canada along British lines and has established an excellent performance record in service. It has a four-wheel drive and is well adapted for muddy or sandy ground. A Bren machine gun is mounted in the small, conical, open-topped turret and a .55-cal. Boys anti-tank rifle is mounted in the left front of the hull. What appears to be the barrel of a larger weapon in the center of the hull face is a 4-in. smoke discharger. The hull is high and box-like with sides that slope gently all around. A large engine hood slants down beyond the front wheels.

## LYNX

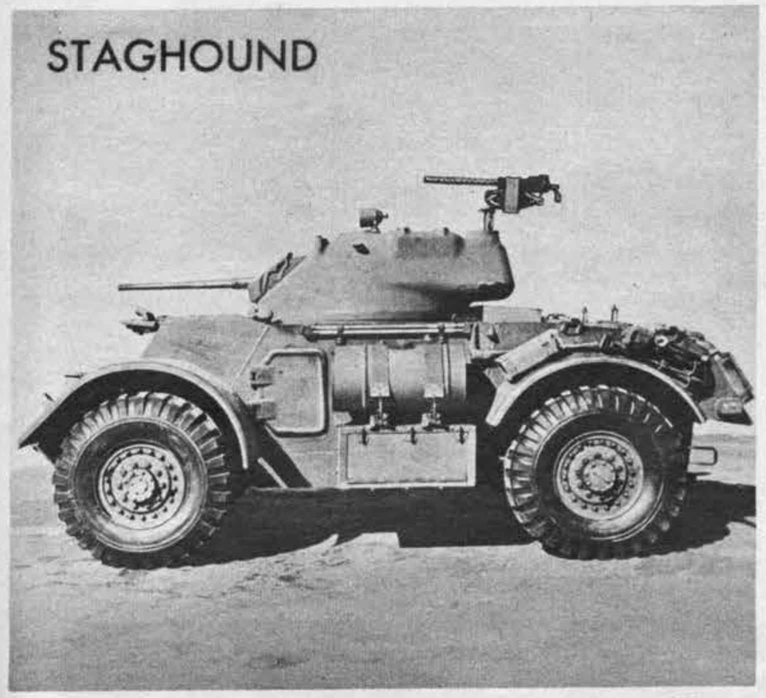


**THE LYNX** is another Canadian vehicle described as "highly spectacular." It is an armored scout car, small, lightly built and very fast. Unique-looking, the Lynx is short and blunt-nosed in front, long and box-like in the rear.

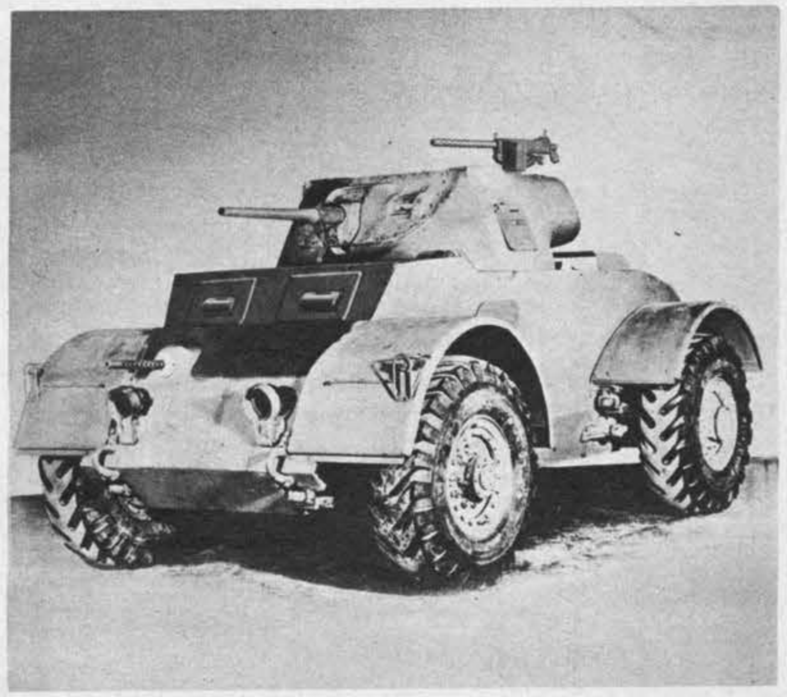


**THE BOW OF THE LYNX** has a long narrow box stretching between front mudguards. Its hull superstructure slants up to a flat top resembling a turret, although the Lynx does not have a turret for its Bren machine gun.

## STAGHOUND

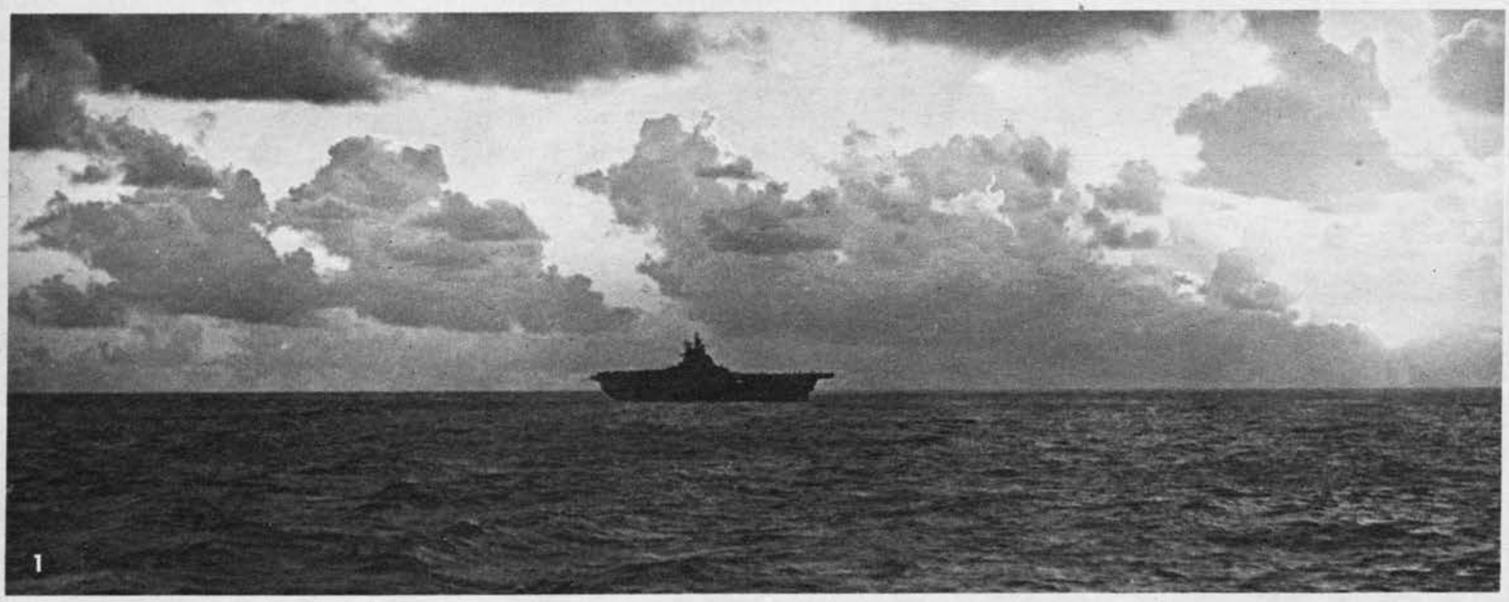


**THE STAGHOUND (T17E1)** is new 15-ton British car built by General Motors. It carries a crew of five, can do 50 m.p.h. and has range of 300 miles. Its prominent tank-type turret has a sloping face, undercut projection at rear.



**STAGHOUND'S ARMAMENT** includes a 37-mm. gun and a coaxial machine gun in the turret, another machine gun in the right bow, and a .30-cal. AA gun on top of the turret. Car is streamlined except for the angular driver's cab.

# QUIZ NO. 3: SHAPES OF THE WAR AT SEA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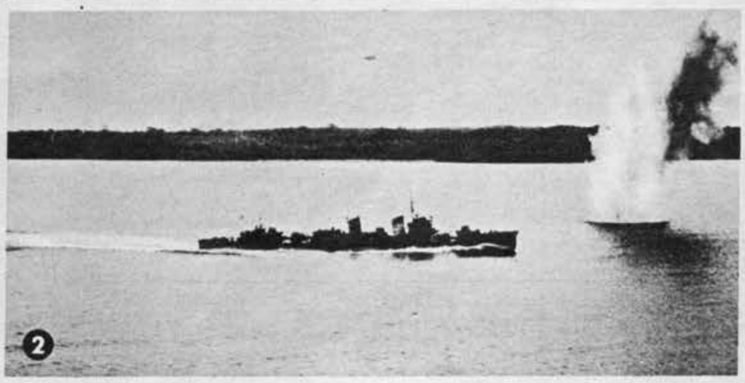
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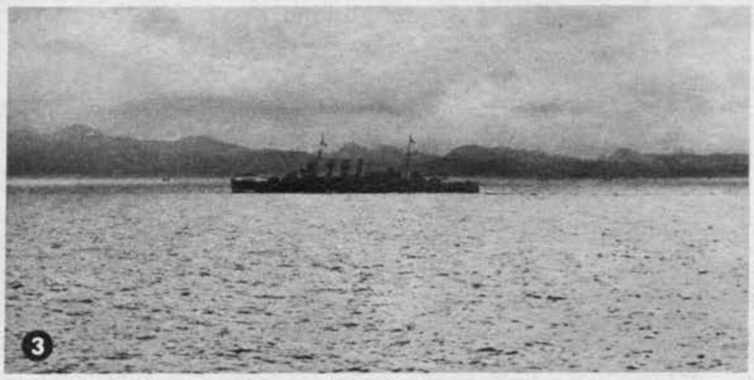
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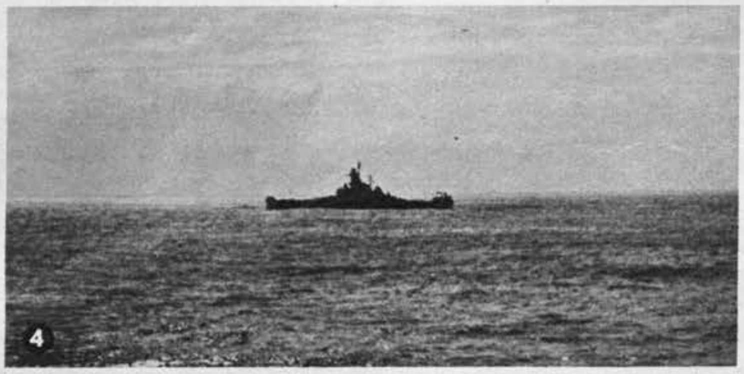
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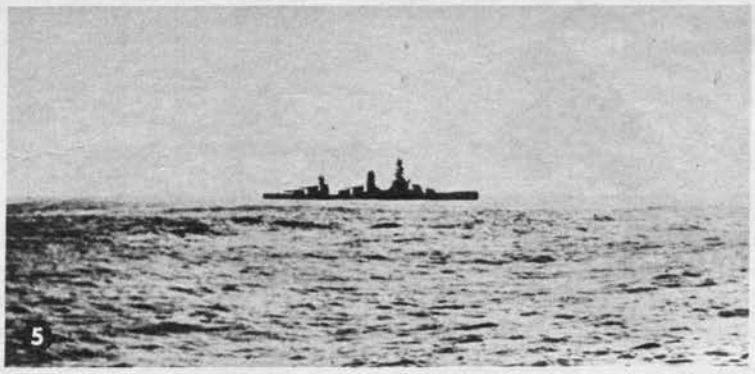
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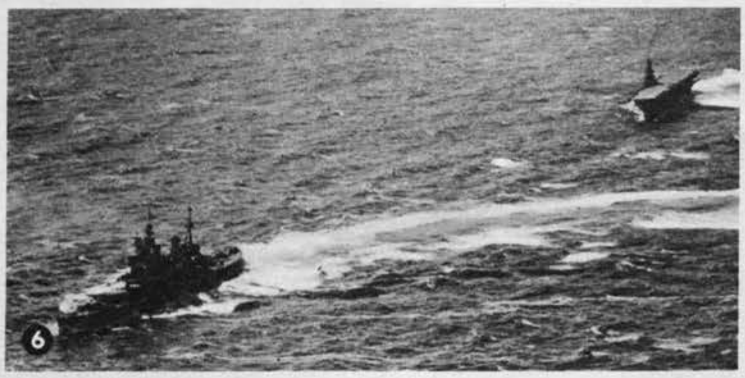
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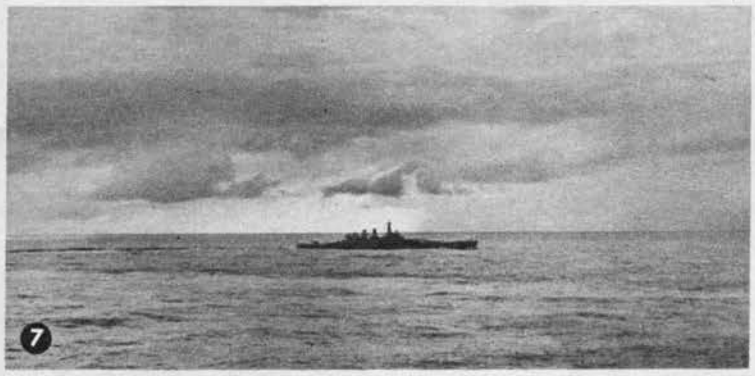
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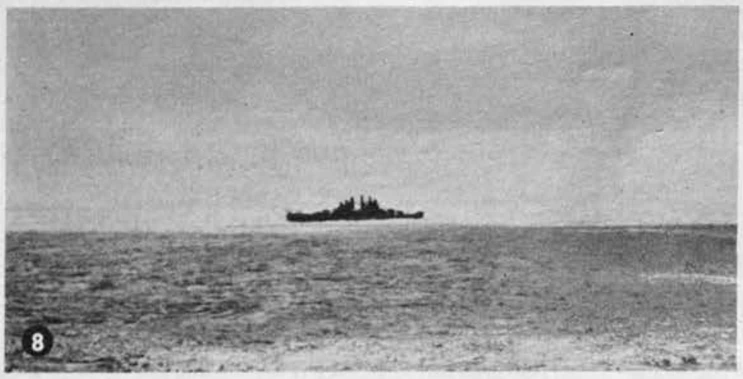
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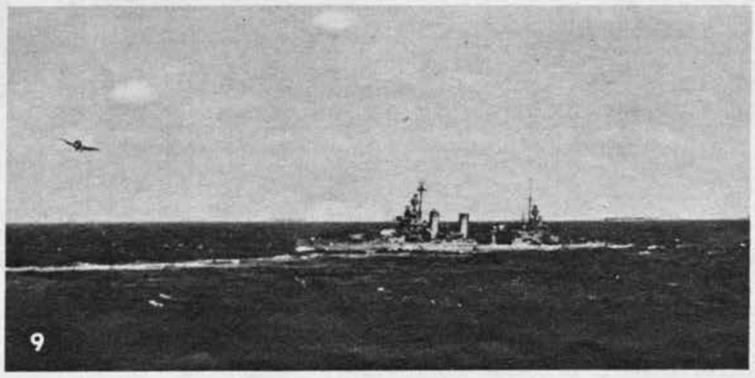

9

For answers, see p. 50.

BEECHCRAFT AT-11 IS ONE OF THE CAMERA PLANES USED BY THE AAF FIRST MOTION PICTURE UNIT. CAMERAS ARE MOUNTED IN THE NOSE AND DORSAL TURRET

# TRAINING FILMS

The best way to teach a man to recognize airplanes in flight is to show him the actual planes in the conditions under which he might see them. Equally obvious is the fact that such a direct method of instruction is impractical. Though actually viewing the real plane in flight is probably the best recognition device of all, it would be impossible to maintain a full array of friendly and enemy planes at every training station. Therefore synthetic devices have had to be set up. One way to simulate visual conditions, the shadowgraph, was described in the January issue of the *Journal*. Another way is the motion picture.

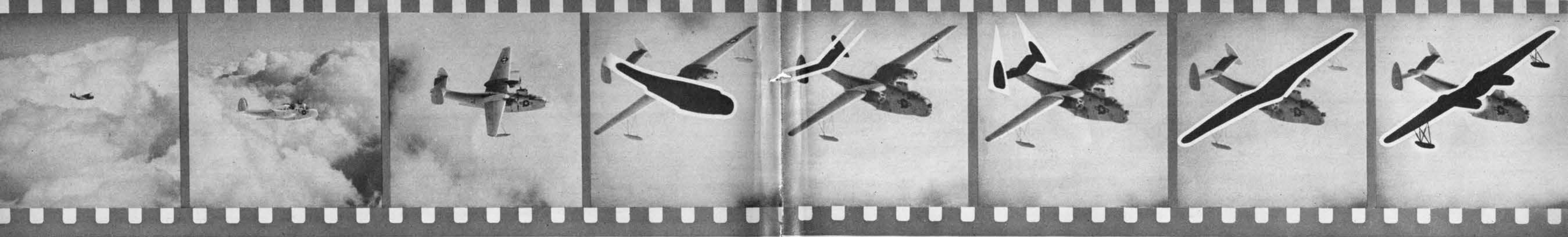
The motion-picture camera is the only means of showing just how an airplane looks in flight. Like the human eye, it sees motion; it sees distorted perspective. By placing the camera on the ground, in the gunner's position or in the nose of the camera plane, the approach or retreat of the plane can be shown as it would appear to a ground observer, a rear-seat gunner, a fighter or bomber pilot. Both Army and Navy recognize the importance of films as the best training-device substitute for viewing planes in actual flight.

Recognition films are now being made in four different types to cover the full course of training. The first of the series, seen by students in the elementary stages of recognition training, is virtually an illustrated glossary of aeronautical terms. It tells exactly what an airplane is and what its parts are called, so that the trainee can learn the language of the air as quickly as possible.

Second in the training sequence is a type of film dealing with the recognition of a single type of plane. This is perhaps the most important type since it gives almost complete coverage of a single plane. It is based on the principle that it is essential to know a plane close up before it can be recognized at a distance. Flying shots of the plane at various distances are combined with close-up stills, while a running commentary points out the features which go to make up the plane's personality. As the plane passes through typical views it is frozen, and cartoon animation is used to highlight the plane's shape.

The Quizcraft Series makes up the third type. The Quizcraft films consist of flying shots of five different planes, friendly and enemy, and are designed for use at a more advanced stage of training. Despite their name, the quiz element is a secondary feature: it is only introduced to maintain interest. None of the shots would present any serious recognition problem to a trained man. The primary object of the Quizcraft films is to give the student an opportunity to see the planes in conditions approaching realism. Distant shots and varying conditions of visibility are emphasized.

A new type of training film about to go into circulation is the Testcraft Series. These, unlike the Quizcraft movies, are actually motion-picture quizzes. Series of planes appear on the screen in



STRIP FROM THE NAVY'S FILM ON THE PBM MARINER ILLUSTRATES THE MECHANICS OF A SUMMARY FREEZE. PLANE FLIES INTO A THREE-QUARTER VIEW AT CLOSE RANGE AND IS HELD THERE. ANIMATION IS THEN USED TO OUTLINE THE DIFFERENT ELEMENTS OF THE PLANE'S STRUCTURE AS THE NARRATOR POINTS OUT EACH RECOGNITION FEATURE

## TRAINING FILMS (continued)

flights of a few seconds' duration while the student identifies them on a sheet of paper. By using Testcraft films it is possible to give a number of classes a standardized test and so obtain a comparative rating.

A typical film dealing with the recognition of a single airplane might run as follows: To start with, the plane is shown in a sequence of typical action during which the narrator tells its name, describes its mission and gives any other data of interest. The plane will then fly into the twelve basic attitudes which have been decided upon as best presenting the plane and will be frozen in these positions. Animation is used to point out the salient recognition features (*top of page*). After performing a few minor acrobatics and giving the trainee an opportunity to observe for himself the features pointed out by the narrator, the plane may be frozen again to allow for a brief recapitulation of the important recognition points. The film is then brought to a close. Interest is largely dependent on the quality of the photography, since really good pictures of airplanes will interest most people. Humor may be introduced occasionally but too much is even more dangerous than none at all in that it may distract the trainee's attention from the plane. Each film of this type runs about five to eight minutes.

Quizcraft films run somewhat longer, about ten to twelve minutes. They are shown in conditions and distances most nearly approaching those existing in combat. The average plane will be shown at distances ranging from 600 to 1,000 yards; the smallest planes will be photographed near the camera and larger planes at a greater range. In all cases the planes are shown approaching and receding, gradually growing from pin-point size until they fill the screen.

A large number of recognition training films are now available, covering most of the important operational planes of our own and enemy forces. The British Army and the RAF have long been making films on British and German aircraft. In this country the Army Air Forces and the Navy have produced movies of American and Japanese planes. Revised and approved by the Joint Army-Navy Recognition Committee, the list of planes on which films are available includes the following: P-38, P-47, P-51, A-20, A-29, A-30, A-31, B-17F, B-24, B-25, B-26, C-47, C-54, C-60, F4F, SBD, TBF, PBY, Albacore, Albemarle, Barracuda, Beaufighter, Beaufort, Blenheim, Fulmar, Halifax, Hampden, Horsa glider, Hurricane, Lancaster, Master, Mosquito, Spitfire, Stirling, Sunderland, Typhoon, Wellington, Whitley, Me-110, Me-210, BV-138, Do-217, FW-189, FW-200K, FW-190, DFS-230, Go-242, He-111K, He-177, He-115, Ju-52, Ju-87, Zeke. Besides two general films entitled *Introduction to Aircraft Identification* and *Planes of the U. S. Navy*, seven numbers of the Quizcraft Series may now be obtained: No. 1 (Spitfire, Hurricane, Ju-88, Halifax, Blenheim IV); No. 2 (P-40, P-39, Ju-87B, Hudson, Wellington); No. 3 (Defiant, Stirling, Beaufighter, Manchester, PBY); No. 4 (Maryland, Me-109E, Sunderland, Whitley, Boston III); No. 5 (Fulmar, Me-110, He-111, Bristol, Beaufort, P-51); No. 6 (Typhoon, Ju-52, FW-190, Lancaster, Mosquito); No. 7 (B-25, B-24, P-38, B-26, B-17).

As new planes go into service they will be covered by appropriate motion-picture units. Here is the list of present projects for recognition films including revisions: C-46, CG-4A, L-4, B-29, A-26, L-5, B-32, P-61, P-63 with P-39 as trailer, P-40, P-51, Oscar, Hamp, Tony, Dinah, Lily, Nell, Sally, Stirling, Me-110, Do-217, Ju-52, PBM, F6F, F4U, SB2C, OS2U, Rufe, Kate, Val II, Betty, Mavis. The British are working on films covering the clipped-wing and Mark IX versions of the Spitfire, Tempest V, Hs-129, Me-109F and G, and Me-323. Quizcraft projects are: No. 11 (CG-4A, B-29, A-26, L-4, Zeke); No. 12 (C-46, C-54, C-60, L-5, A-35); No. 14 (P-61, P-63, A-30, P-40); (F6F, F4U, SBD, TBF, PV); (PB2Y, OS2U, PBM, SB2C). As films become available for distribution they are listed in various catalogs. Army Ground & Service Forces will find the lists in Field Manual 21-7; the Air Forces in the AAF Film and Film Strip Catalog; and the Navy in Naval Aviation Training Films Bulletin No. 8. Army films are distributed to Army Ground & Service Forces through a system of libraries. Sub-libraries are established at major troop concentrations, including divisional camps and replacement training centers. Air Forces films may be obtained by any AAF activity by sending a requisition, approved by the Headquarters of the Command or Air Force, to Training Aids Division, AAF, One Park Avenue, New York 16, N. Y., Attention: Distribution Section. Films for Navy units may be borrowed from the nearest Central Aviation Film Library, or ordered from CNO Op-33-J via the Administrative command. New films will be announced and made available through the regular channels.

**CAMERA POSITION** in nose provides an opportunity for shots forward and down, may be used to simulate fighter runs on attacks on target airplane.

**CAMERAMAN'S COCKPIT** in the A-29 used by AAF First Motion Picture Unit is in top gun position. It gives the free gunner's view of the attacking plane.

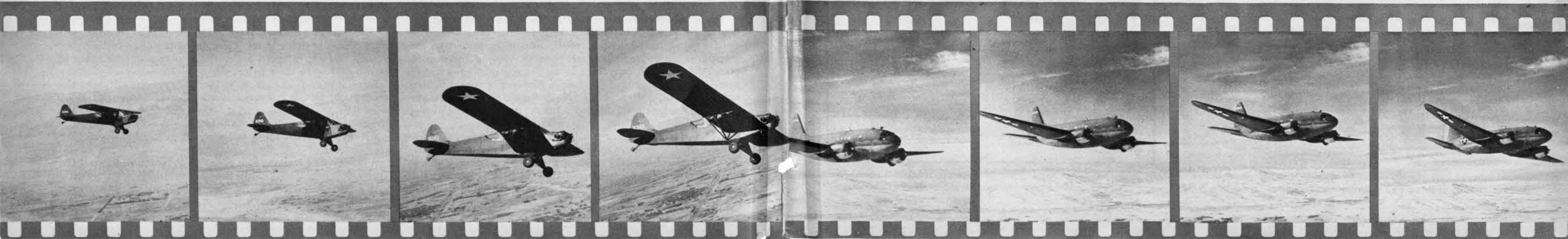
# "HELL'S ANGELS" CREW MAKES MOVIES FOR ARMY

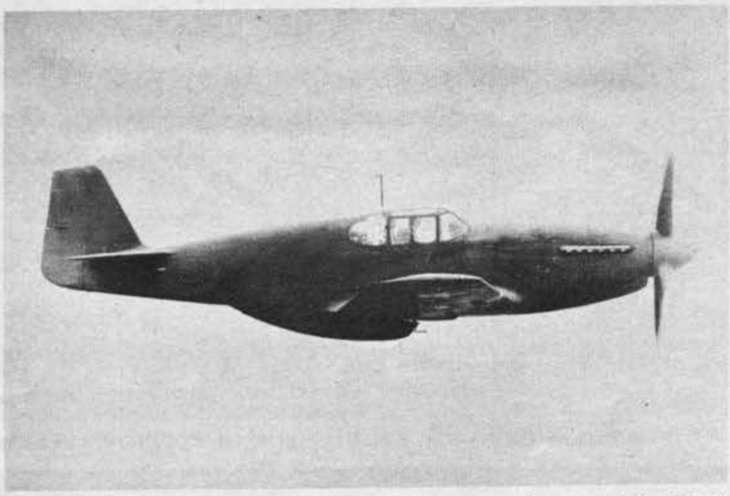
Helping the Army Air Forces to make training films at its Culver City, Calif., studio is one of the most experienced aerial camera crews in the world. Two of the pilots flew throughout the three-year filming of *Hell's Angels*, during which time one of them put in more hours in a Fokker D-7 than any German pilot did in the last war. They have had wide experience in many of the aviation pictures which Hollywood has produced in recent years.

But despite this prize crew, the First Motion Picture Unit has encountered difficulties in completing pictures to fit the technical advisor's specifications. At various times, four camera planes have been available: an AT-11, an A-29, an A-25, and an A-20. Since both the AT-11 and A-29 are twin-motored, twin-tailed planes, it is impossible to get clear shots forward and astern from them. However, neither is quite fast enough to deal adequately with very fast fighters such as the P-51, which fly out of close range before camera can get a good view of them. On the other hand, the crew ran into the opposite trouble in filming the extremely slow Piper Cub, the Army's L-4, from the AT-11, the slowest of the camera planes.

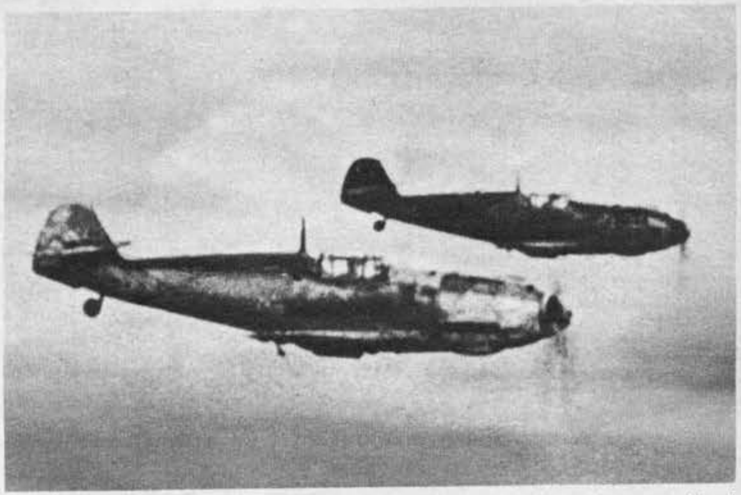
To get a straight side view of the L-4 it was necessary to put it into a dive until it attained its maximum speed, then pull out alongside the camera plane. Meanwhile the pilot of the camera plane had to lower the wheels and flaps to slow down the AT-11 as much as possible. As he came alongside the L-4, he was shocked to see his indicated air speed. It was 64 m.p.h., well below stalling speed.

EXTREMELY SLOW SPEED OF L-4, THE U. S. ARMY'S CHIEF ARTILLERY SPOTTING PLANE, POSED A SPECIAL PROBLEM FOR ARMY CAMERA CREW IN MAKING THE SCENE BELOW. AMONG THE FILMS BEING PREPARED BY THE AAF FIRST MOTION PICTURE UNIT IS ONE ON THE C-46, BIG-BELLIED CARGO PLANE INTENDED AS THE C-47's REPLACEMENT

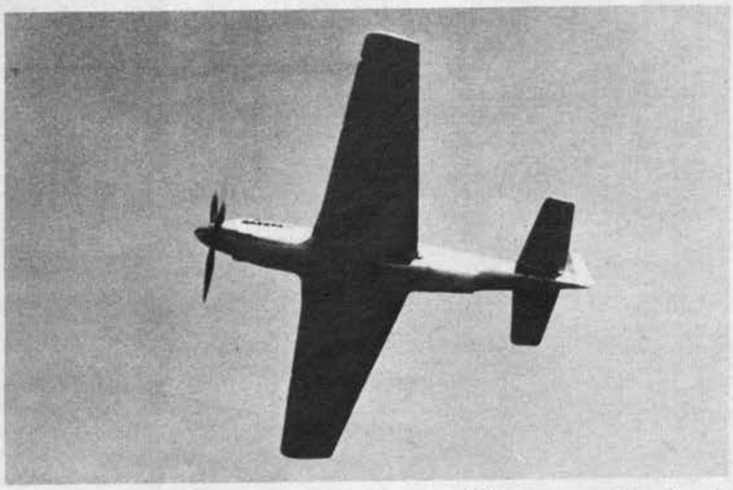




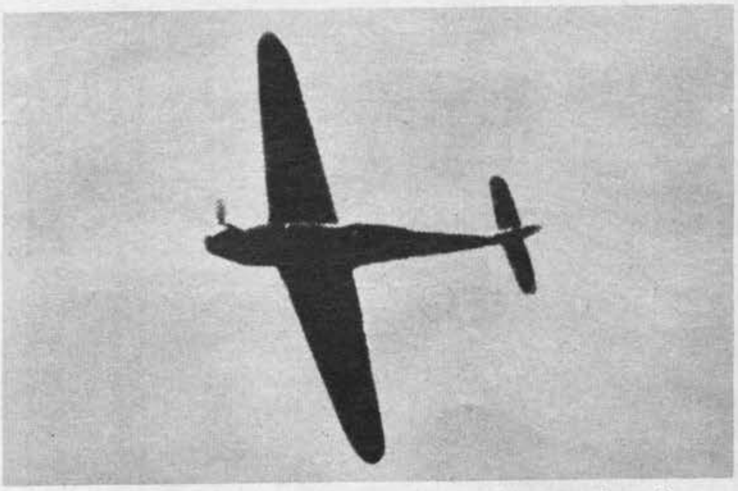
**RECTANGULAR FIN AND RUDDER** is salient recognition feature of the P-51's side view. In latest model (*above*) airscoop atop nose has been removed.



**IN ME-109 SIDE VIEW** nose is thicker than P-51, fuselage is streamlined to smooth oval-shaped fin and rudder with cantilever tailplane set high.



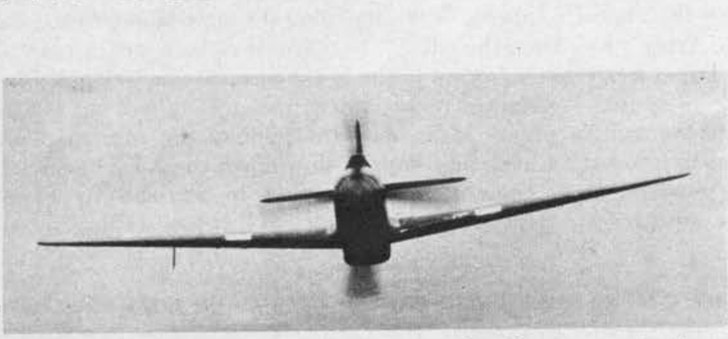
**SQUARE CONTOURS** of Mustang's wing and stabilizer are outstanding in plan view. The wing has marked taper, most pronounced on trailing edge.



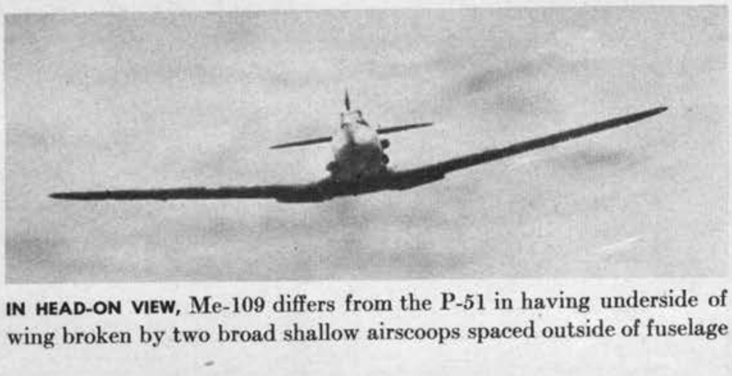
**ME-109'S STREAMLINED WING** is set farther forward on fuselage than on P-51. Leading edge is almost straight although distorted in above view.

# P-51 AND ME-109 LOOK DIFFERENT

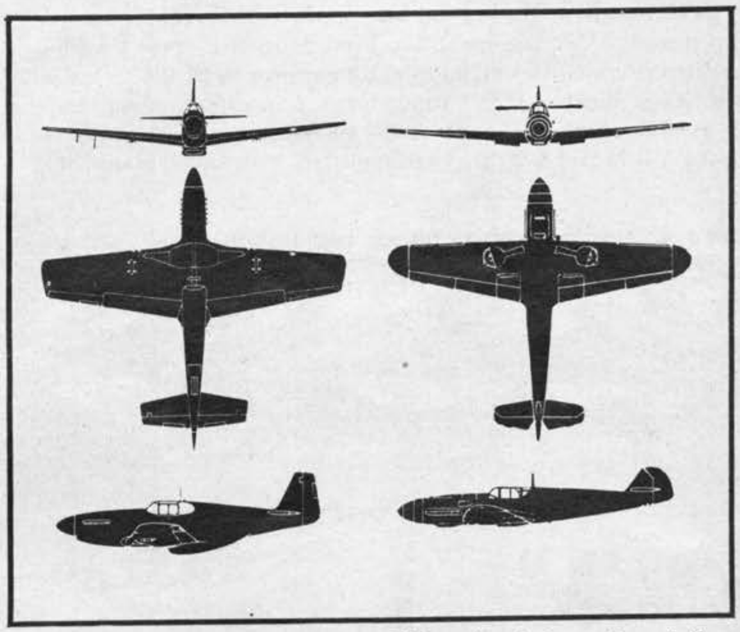
When they revamped the design of the Me-109 fighter, the Germans unwittingly helped solve a difficult recognition problem in ETO. The 109E, which took such a beating from the Spitfire, had a squarish wing much resembling the P-51's. In the current F and G models the slightly longer wing has rounded tips, sharp taper on trailing edge. Recent improvements in the power plant of newest P-51 model have added considerably to its high-altitude performance, but fortunately from a recognition standpoint have not changed its square lines, overall angular appearance.



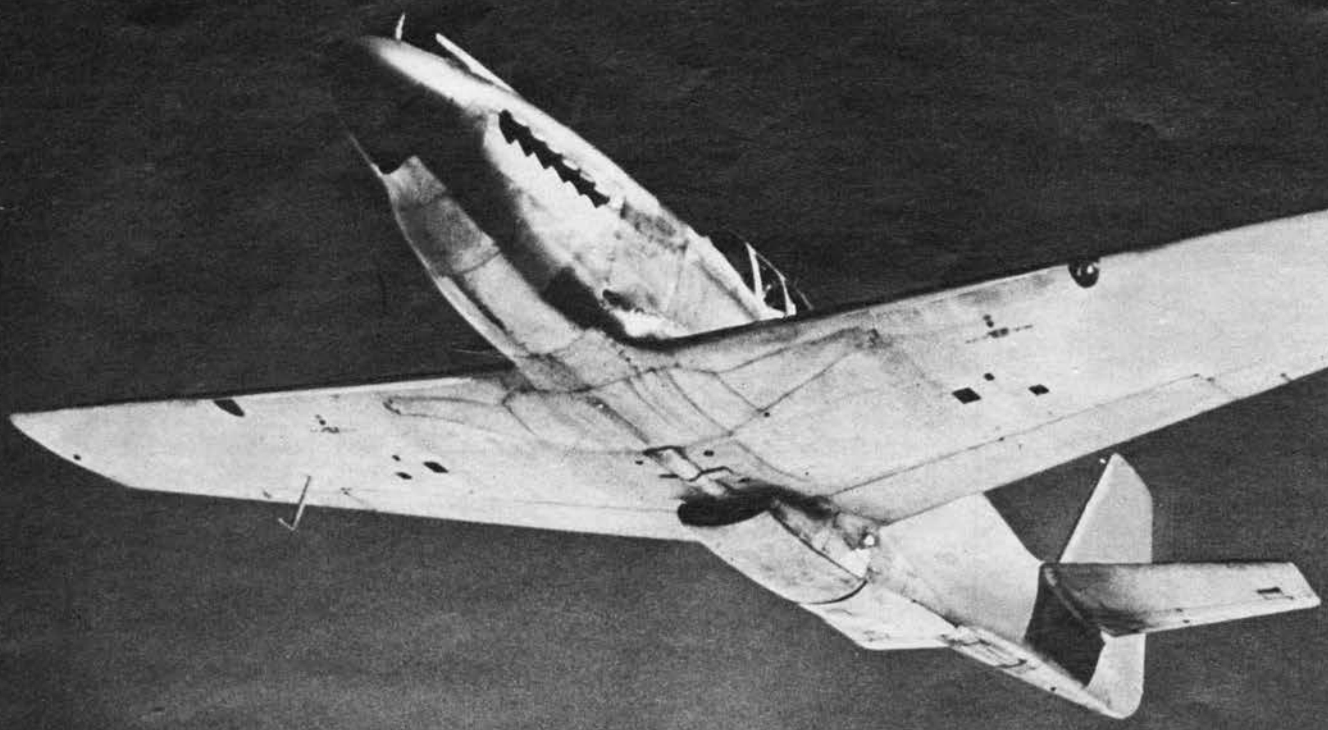
**WINGS HAVE FULL DIHEDRAL** on both airplanes, but the narrower fuselage, heavy airscoop directly below fuselage help distinguish the P-51 (*above*).



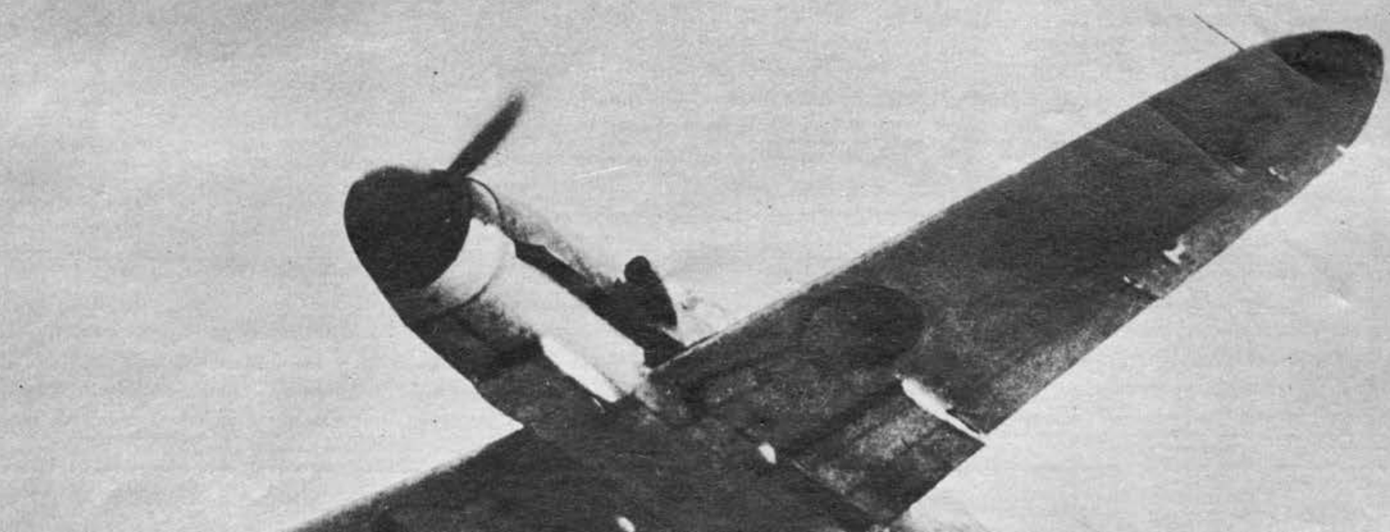
**IN HEAD-ON VIEW,** Me-109 differs from the P-51 in having underside of wing broken by two broad shallow airscoops spaced outside of fuselage



**AN IMPORTANT AID** in learning how to differentiate between two similar-appearing planes is the basic silhouette which simplifies their outlines.



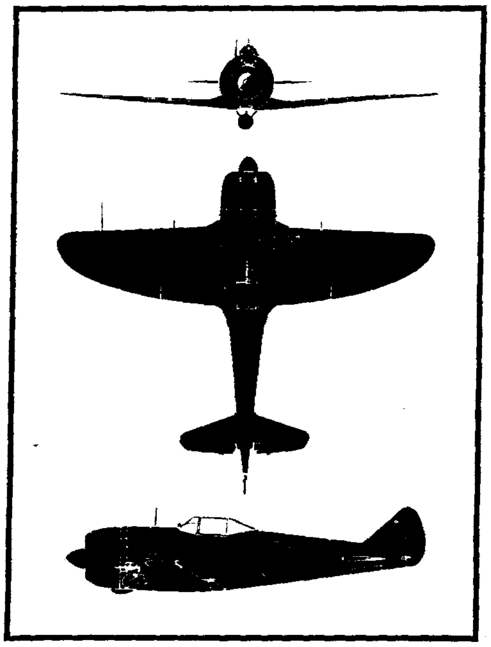
**SIX MAJOR DIFFERENCES** between these two fighters are shown clearly on this page. They are: square vs. rounded wings; shape and position of stabilizers; broken bellyline; high rectangular vs. low rounded fin and rudder; more pointed nose vs. large round spinner; position of wing on fuselage. Leading edge of Me-109's wing straightens in view below, taper on P-51's is lost in comparison with plan views on the opposite page.



# NEWS & MISCELLANY

## NEWS

Tojo, new Japanese fighter, wing span 31 ft. 2 in., length 29 ft. 1 in., has now been shot down in every Japanese theater, giving evidence of wider operation of this newest and smallest of Jap fighters. Tojo has an amazing rate of climb and the highest level speed of any Jap fighter. It has been mistaken for the P-47 because of similarity of wing shape.



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To prevent the use of small craft to transport enemy agents and contraband, or to supply enemy submarines, all small craft in the Caribbean are now marked with an identification letter and number. This identification appears on the bow, sails and top of deckhouse. Complete data will be found in ONI-208-c, Caribbean Small Craft Identification Manual.

## TRAINING AIDS

### Equipment for Naval Aviation Activities

Sets of Recognition equipment have been assigned to meet the needs of those aviation activities requiring such training gear. For activities coming under the cognizance of Unit Air Commands, this equipment has been allotted to the Commands for distribution at their discretion under the supervision of officers-in-charge of Recognition who are attached to the staffs. These Commands are supplied with supplementary sets of slides in quantities consistent with the number of sets of equipment issued to the Command. Activities not under Unit Commanders receive their equipment and slides direct.

Records of distribution of such equipment are maintained in Op-33-D1, Aviation Training Division in Washington, which show the type of equipment and the extent to which slides are issued for each set. Considerable difficulty in keeping track of the sets allotted directly to activities other than Unit Commands has occurred in the past when equipment has been transferred from one activity to another. In some instances, no notice was given to Washington, and, in others, notification was made but no details were included such as the items of equipment transferred.

In order to keep the records in Washington as complete and up-to-date as possible, the type and number of projectors, supplementary parts included and the designation of the slide sets should be given. Recognition slide equipment originally consisted solely of a basic list of approximately 1,000 slides. However, these slides gave inadequate coverage and it became necessary to issue supplementary slides to this list. As new pictorial material became available, slides were manufactured and distributed in groups of 100 or less with an accompanying identifying list. The basic list and supplements thereto presented mainly close-up views of all subject material. The need for more advanced slide material became evident with the result that a second type of supplementary slide material was produced. These slides consist of distant views of all subject material appearing on the basic and supplementary lists. At the present time, 12 supplementary slide lists have been distributed, both close-up and distant, while eight supplements are in the process of being manufactured and will be distributed periodically over the next two months.

When the present Recognition program was first inaugurated, projectors using 3¼-in. x 4-in. slides were issued. Later, due to procurement difficulties and for other reasons, a smaller set of equipment using 2-in. x 2-in. slides was distributed and is now considered standard.

As the program expanded, there was not enough 2-in. x 2-in. equipment available to supply the demands of aviation activities. Consequently, the larger projectors continued to be used with 2-in. x 2-in. slide changer added to permit use of the smaller slides. It is now planned to replace all 3¼-in. x 4-in. equipment with 2-in. x 2-in. equipment. It is also desired to effect the return of all 2-in. x 2-in. sets not currently in use. On notification that sets of 2-in. x 2-in. equipment are available for redistribution, Op-33-D1 will arrange for their disposition.

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Slides corresponding to the following NavAer slide lists have been, or will be, shipped to *all* Naval Aviation Activities to which Recognition training equipment has been shipped according to CNO, Op-33-D1, records:

| Slide List | Coverage | No. of Slides |
|---|---|---|
| Basic | After deletion | 929 |
| A | Supplement to Basic List | 82 |
| B | “ “ “ “ | 75 |
| C | “ “ “ “ | 89 |
| D | “ “ “ “ | 50 |
| E | “ “ “ “ | 50 |
| E-1 | “ “ “ “ | 91 |
| F | “ “ “ “ | 100 |
| G | “ “ “ “ | 100 |
| H | “ “ “ “ | 100 |
| I | “ “ “ “ | 100 |
| J | “ “ “ “ | 70 |
| K | “ “ “ “ | 67 |

Slides covered by the following supplementary lists have been, or will be, shipped in the future to all Naval Aviation Activities where equipment is located, as referred to above, *except* NATT centers and activities under NAPTC:

| Slide List | Coverage | No. of Slides |
|---|---|---|
| A-1 | Distant views of U. S. Ships | 80 |
| B-1 | “ “ “ Ital. & Ger. Ships | 66 |
| C-1 | “ “ “ British Ships | 76 |
| D-1 | “ “ “ Japanese Ships | 44 |
| F-1 | “ “ “ Japanese Planes | 82 |
| G-1 | “ “ “ German Planes | 100 |
| H-1 | “ “ “ U. S. Navy Planes | 66 |
| I-1 | “ “ “ U. S. Army Planes | 90 |
| J-1 | “ “ “ British Planes | 92 |
| K-1 | “ “ “ Russian Planes | 33 |

With the exception of slide list E-1, slide lists identified by a letter of the alphabet with the number 1 added designate slides containing advanced material, namely distant views of planes and ships. All the other alphabetical lists are supplementary to the original Basic list of close up views.

## QUIZ ANSWERS

**QUIZ No. 1:**

1. C-46
2. Topsy
3. Nell
4. He-177
5. Blenheim
6. Do-217
7. B-26
8. Dinah
9. Sally
10. Wellington
11. PV Ventura
12. B-26
13. Ju-88
14. P-38
15. A-20

**QUIZ No. 2:**

1. (Left to right) U. S. Light Tank M-5, M-3 Half-track, Medium Tank M-3
2. British Daimler Armored Car
3. U. S. Medium Tank M-4
4. British Churchill Infantry Tank
5. German PzKw Mark V, Panther
6. U. S. Mult. Gun Motor Carriage T28E1 (Early Version of M-15)
7. Japanese Light Tank 2595
8. U. S. 75-mm. Gun Motor Carriage, M-3
9. U. S. 75-mm. Howitzer Motor Carriage, M-8
10. U. S. Light Tank M-5

**QUIZ No. 3:**

1. Essex Class CV
2. Mutsuki Class DD
3. Kent Class CA
4. South Dakota Class BB
5. Ise Class BB
6. King George V Class BB—Ranger CV
7. North Carolina Class BB
8. Cleveland Class CL
9. New Orleans Class CA

**QUIZ No. 4:**

1. F6F
2. FW-190
3. Hurricane
4. Me-109F
5. Zeke
6. Typhoon
7. P-39
8. P-47
9. P-40
10. F4U
11. F4F
12. P-51

## CREDITS

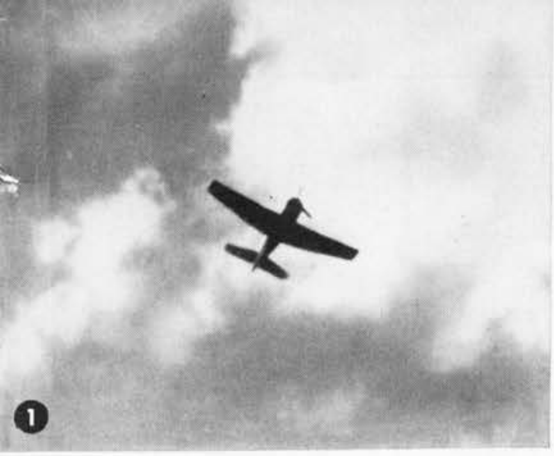
The pictures used in the *Journal* unless otherwise specified (*see below*) came from the Allied Armed Services.

4-5—Fred Cooper
24—Cen., Acme bot. W.W.
25—Top, Int.
28—Top, Eliot Elisofon; second row, Newsreel Pool; third row, cen., Eliot Elisofon; fourth row, left, Robert Capa
30—Bot., Acme
31—Top, L. P. Clarke
36—Cen., Int.
51—Fourth row, left, Courtesy Bell Aircraft Corp.

Abbreviations: W.W., Wide World; Int., International

# QUIZ NO. 4: SINGLE-ENGINE FIGHTERS

(For answers, see p. 50)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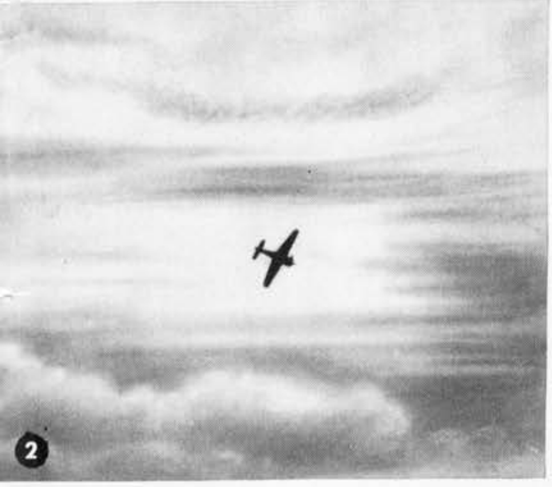
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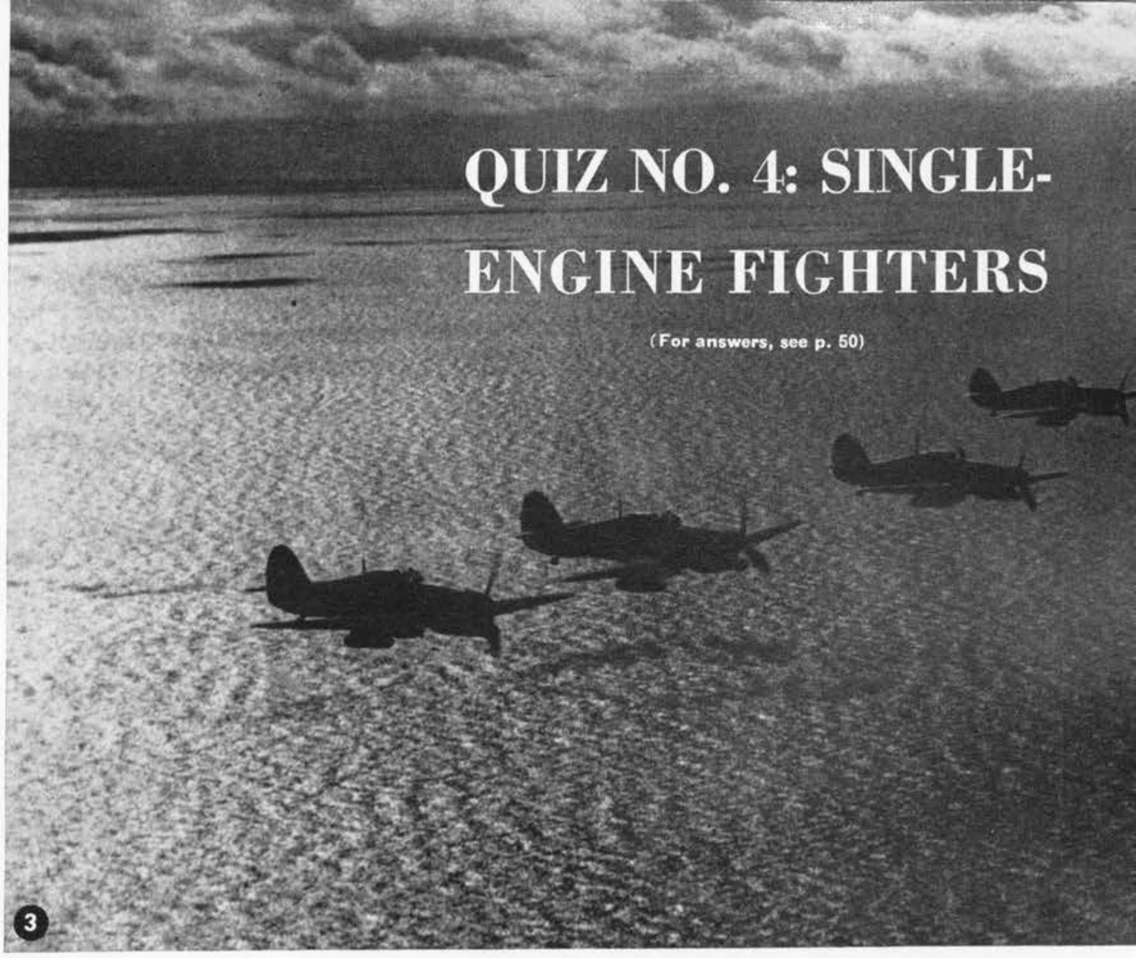
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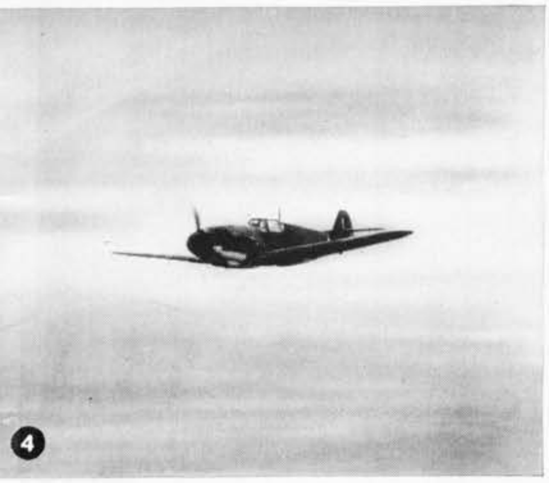
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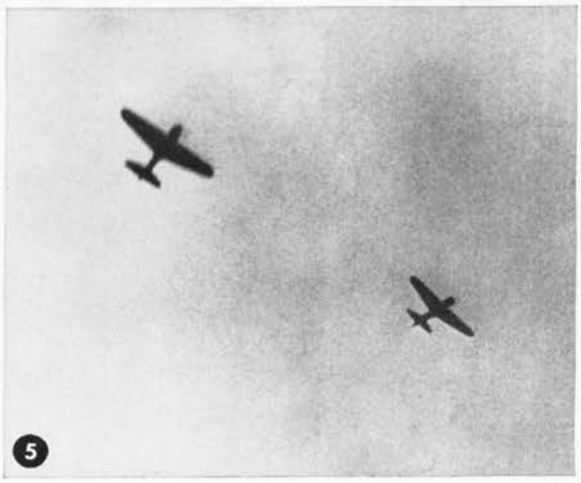
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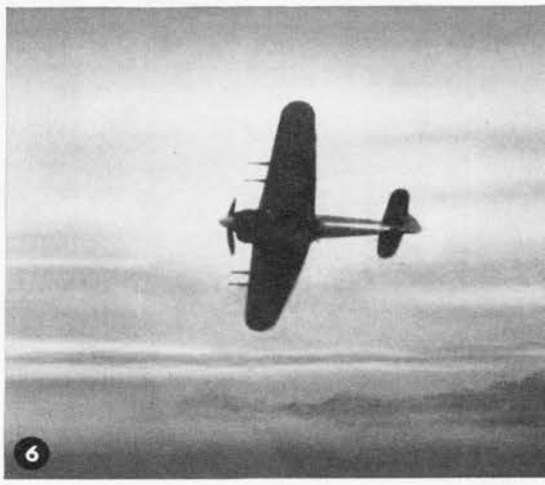
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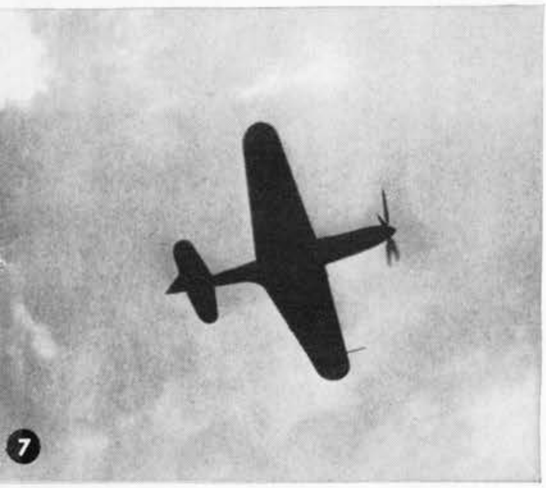
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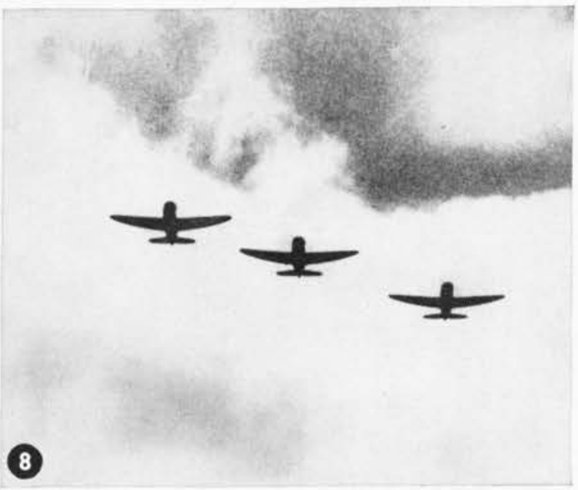
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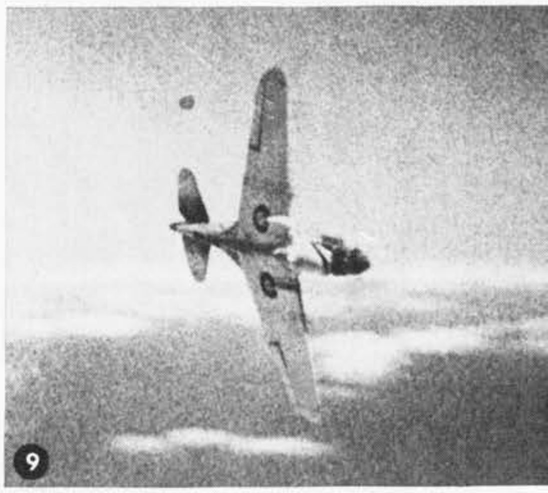
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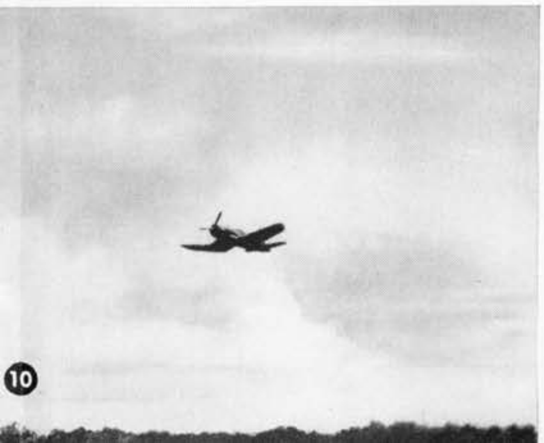
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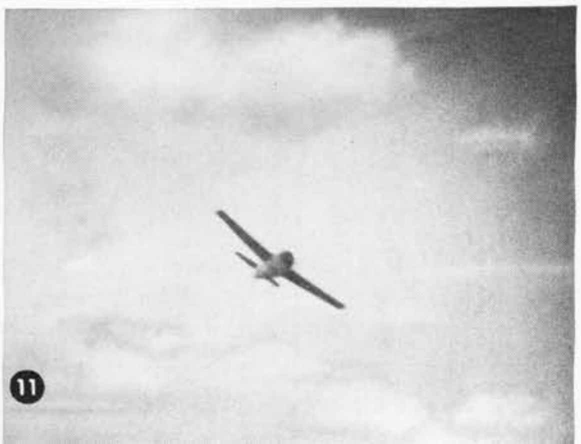
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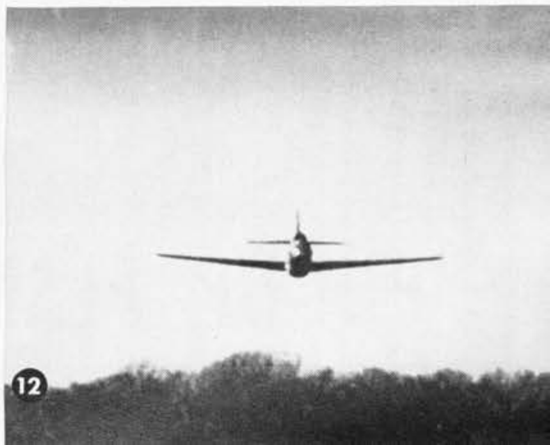
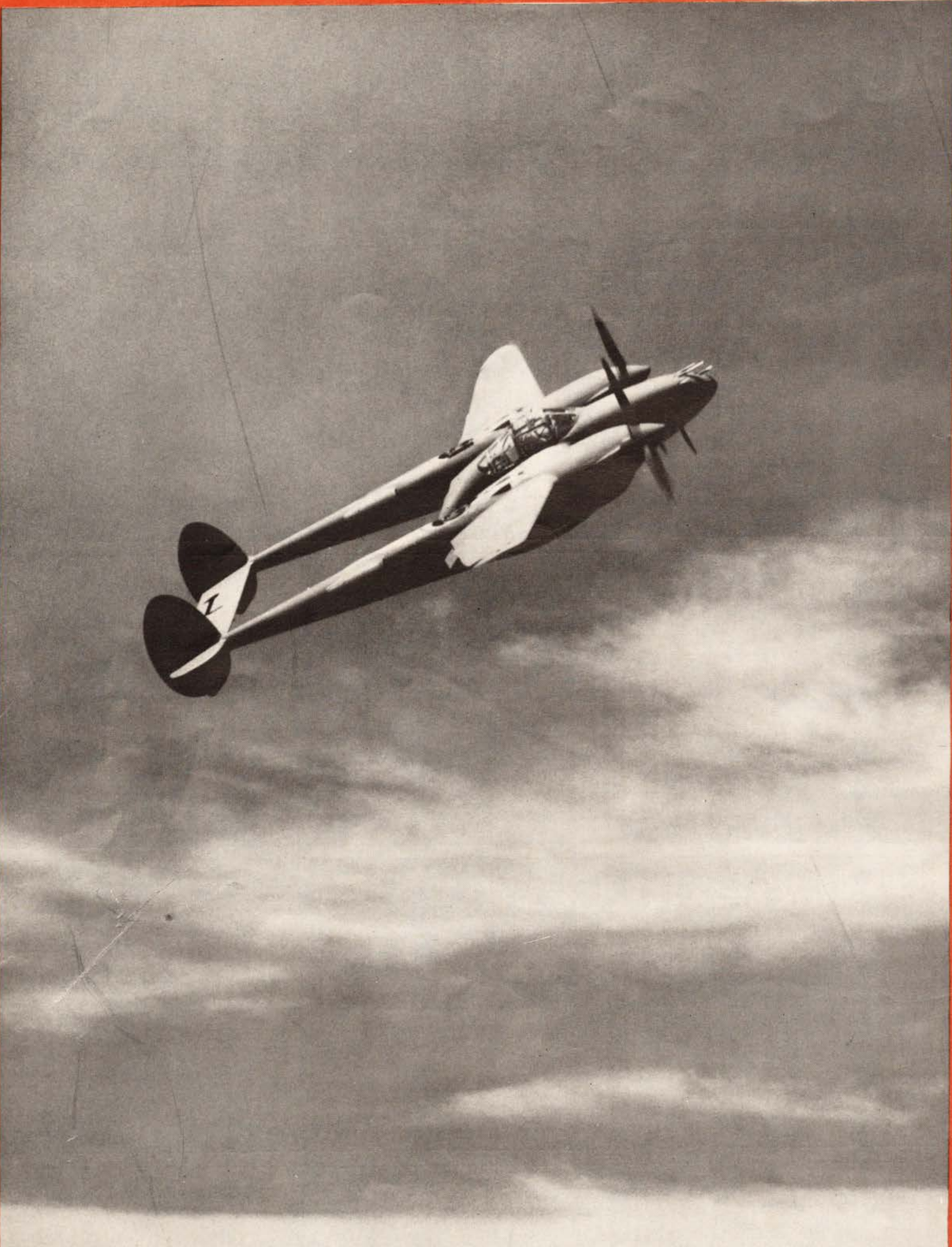

12



## PIN-UP PLANE

Plane of the month for April is the P-38. One of the most versatile U. S. combat planes, the Lightning has been an outstanding interceptor and escort fighter as well as a fine photographic reconnaissance and ground-attack plane. The new model fights higher than ever.